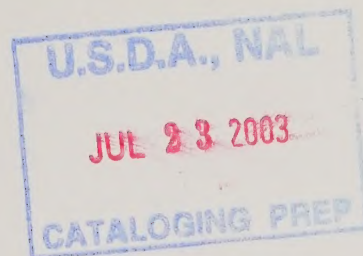


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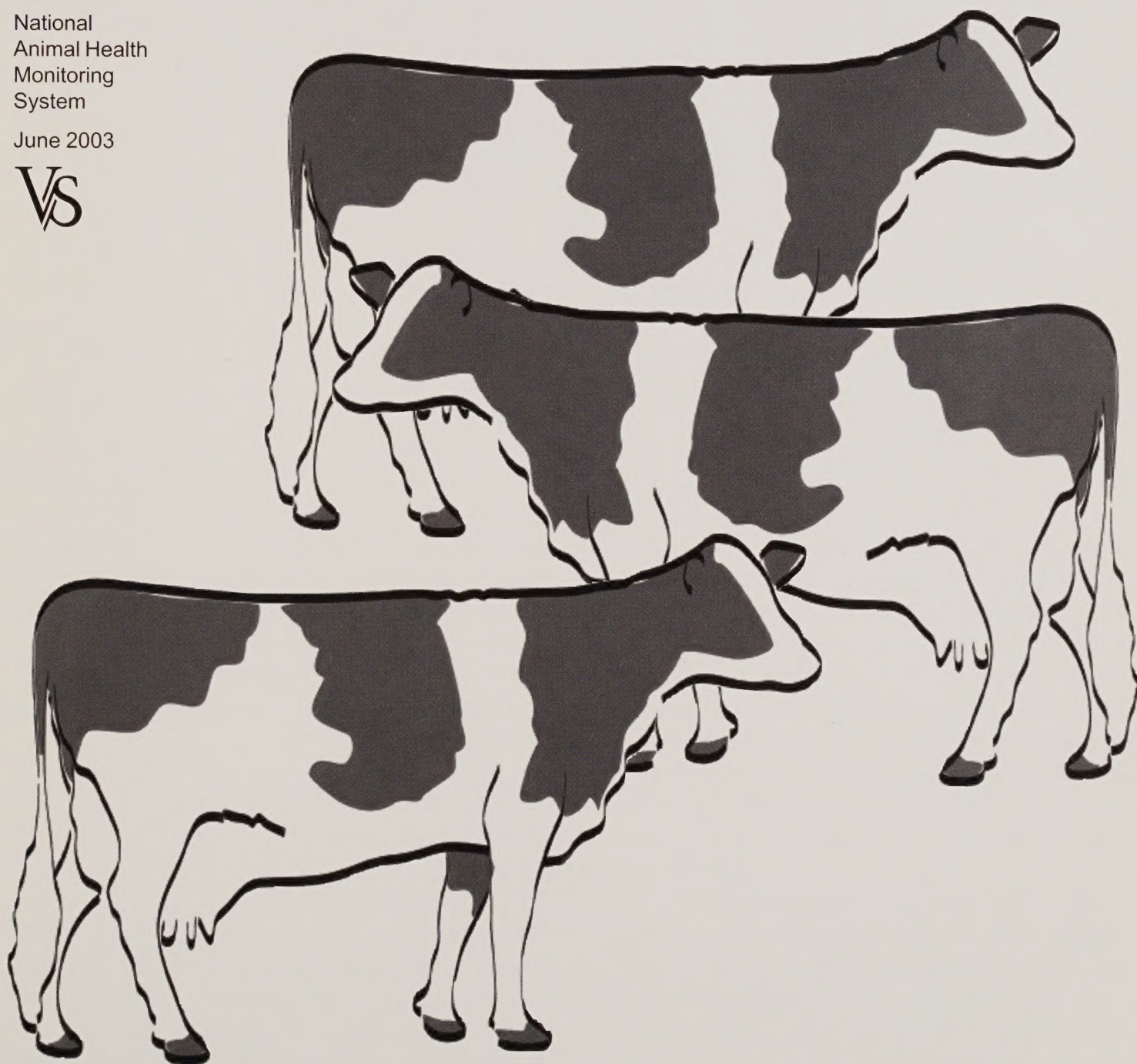
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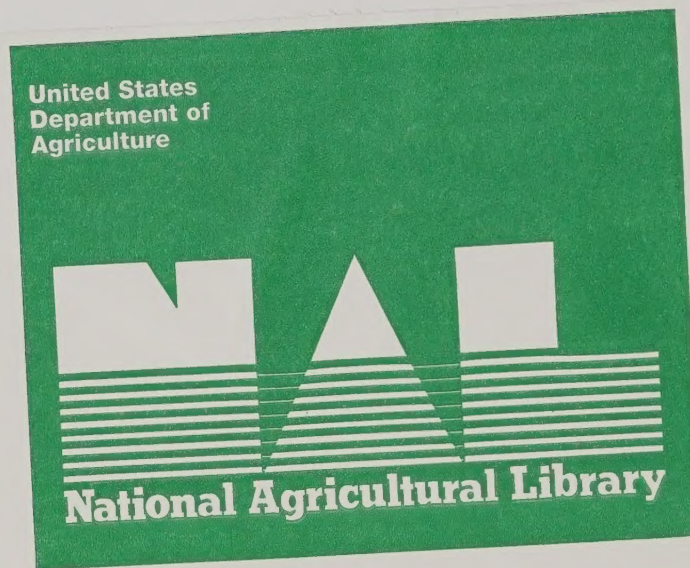


# Dairy 2002

## Part II: Changes in the United States Dairy Industry, 1991–2002







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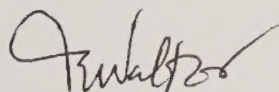
This report has been prepared from material received and analyzed by the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) via three national studies of health management and animal health on U.S. dairy operations conducted between 1991 and 2002.

The 1991 National Dairy Heifer Evaluation Project, Dairy '96, and Dairy 2002 were cooperative efforts between State and Federal agricultural statisticians, animal health officials, university researchers, and extension personnel. We want to thank the National Agricultural Statistics Service (NASS) enumerators, State and Federal Veterinary Medical Officers (VMOs), and Animal Health Technicians (AHTs) who visited the farms and collected the data. Their hard work and dedication to the National Animal Health Monitoring System (NAHMS) are invaluable. The roles of the producer, Area Veterinarian in Charge (AVIC), NAHMS Coordinator, VMO, AHT, and NASS enumerator were critical in providing quality data for Dairy 2002 reports. Thanks also to the personnel at the Centers for Epidemiology and Animal Health (CEAH) for their efforts in generating and distributing valuable reports from Dairy 2002 data.

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- USDA:ARS, National Animal Disease Center
- USDA:ARS, Beltsville Animal Research Center
- USDA:ARS, Russell Research Center
- Colorado State University, College of Veterinary Medicine and Biomedical Sciences
- BIOCOR Animal Health
- IDEXX
- University of California at Davis
- TREK Diagnostic Systems
- Antel BioSystems, Inc.

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Director  
Centers for Epidemiology and Animal Health



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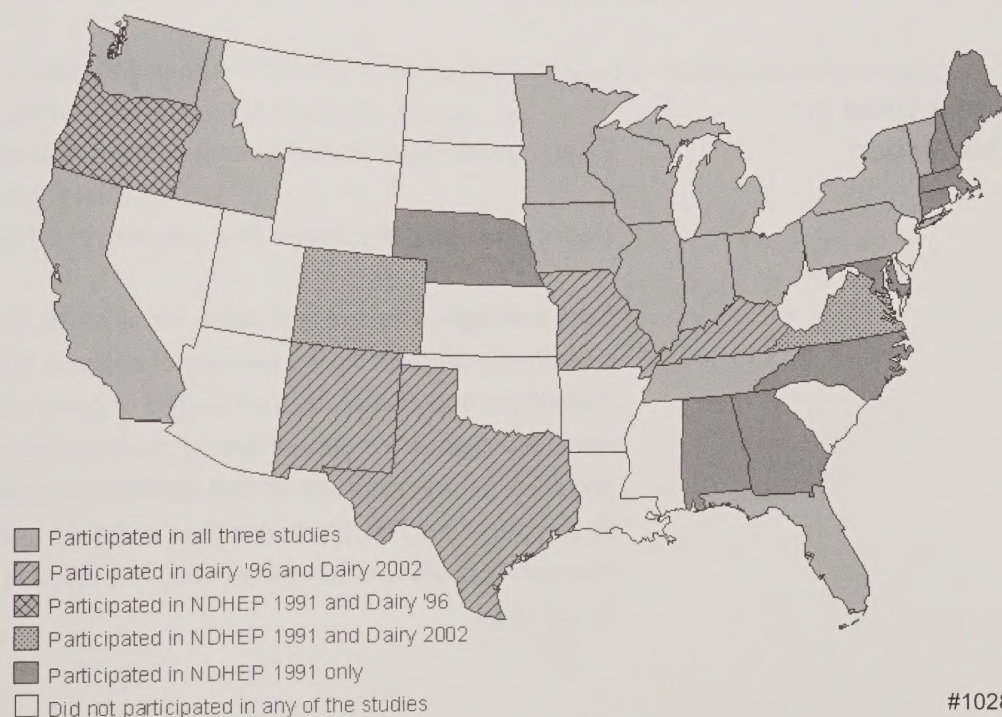
## Introduction

In 1983, promoters of the concept that would become the USDA's National Animal Health Monitoring System (NAHMS) envisioned a program that would monitor changes and trends in national animal health and management. They hoped to provide periodic snapshots of U.S. food animal industries. With these industry overviews, members could identify opportunities for improvement, provide changing foundations for research and special studies, and detect emerging problems.

Section I of this report shows demographic changes of the U.S. and world dairy industries from a historical perspective from data provided by the National Agricultural Statistics Service (NASS), Census of Agriculture, and Foreign Agriculture Service. Results of three NAHMS national studies in Section II complete the overview of change in the U.S. dairy industry during the 10-year period of 1991 to 2002.

NAHMS' first national study of the U.S. dairy industry, 1991's National Dairy Heifer Evaluation Project (NDHEP), provided the snapshot of animal health and management that would serve as a baseline from which to measure industry changes in animal health and management. NAHMS' Dairy '96 and Dairy 2002 studies have fulfilled the vision of the program's founding objective, monitoring the trends in national animal health and management practices.

### States Participating in NAHMS Dairy Studies, 1991, 1996, 2002



#1028

\*Identification numbers are assigned to each graph in this report, for public reference.

The 1991 NDHEP included herds of 30 or more milk cows and heifer-rearing operations in 28 States representing 83 percent of U.S. milk cows (see map on previous page). Dairy '96 described dairy production for operations with one or more milk cows in 20 States representing 83 percent of the nation's milk cows. Dairy 2002 described dairy production for operations with one or more milk cows in 21 States representing 85 percent of the nation's dairy cows. This report, *Dairy 2002: Part II: Changes in the United States Dairy Industry, 1991-2002*, provides national estimates of animal health management practices for comparable populations from all three studies. Some data in this report reflect practices occurring in 2001, although farm visits were conducted primarily in 2002.

Further information on NAHMS studies and reports are available online at: [www.aphis.usda.gov/vs/ceah/cahm](http://www.aphis.usda.gov/vs/ceah/cahm)

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## Terms Used in This Report

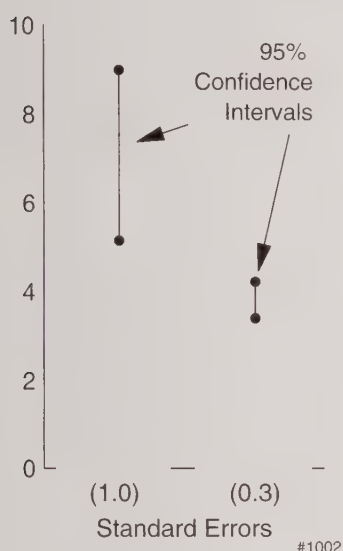
**Cow:** Female dairy bovine that has calved at least once.

**Heifer:** Female dairy bovine that has not yet calved.

**Cow average:** The average value for all cows; the reported value for each operation multiplied by the number of cows on that operation is summed over all operations and divided by the number of cows on all operations. This way, the result is adjusted for the number of cows on each operation. For instance, on page 24, the average age at first calving is multiplied by the number of cows for each operation. This product is then summed over all operations and divided by the sum of cows over all operations. The result is the average age at first calving for all cows.



### Examples of a 95% Confidence Interval



**Operation average:** A single value for each operation is summed over all operations reporting divided by the number of operations reporting. For instance, operation average age at first calving (shown on page 24) is calculated by summing reported average age over all operations divided by the number of operations.

**Population estimates:** Estimates in this report are provided with a measure of precision called the **standard error**. A 95 percent confidence interval can be created with bounds equal to the estimate, plus or minus two standard errors. If the only error is sampling error, the confidence intervals created in this manner will contain the true population mean 95 out of 100 times. In the example on the left, an estimate of 7.5 with a standard error of 1.0 results in limits of 5.5 to 9.5 (two times the standard error above and below the estimate). The second estimate of 3.4 shows a standard error of 0.3 and results in limits of 2.8 and 4.0. Alternatively, the 90 percent confidence interval would be created by multiplying the standard error by 1.65 instead of 2. Most estimates in this report are rounded to the nearest tenth. If rounded to 0, the standard error was reported. If there were no reports of the event, no standard error was reported.

**Producer-perceived cause:** Causes of illnesses and deaths are derived from observations of clinical signs reported by participating producers and may or may not have been substantiated by a veterinarian or laboratory.

**Physical contact:** Possible nose-to-nose contact or sniffing/touching/licking each other, including through a fence.

**NA:** Not applicable.



## Section I: Demographics, 1991-2002

### A. Historical Changes in the U.S. Dairy Industry

#### 1. Milk cow inventory

The Census of Agriculture has collected and reported milk cow numbers at 5-year intervals since 1850. The table below shows inventory numbers based on approximately 10-year intervals (every other Census).

Milk cow numbers steadily increased from 1850 to a peak in 1940 at 24.1 million head. Numbers declined for the next 57 years, with the 1997 level at only 38 percent of the 1940 peak. The number of milk cows as a proportion of all cattle fluctuated around 30 percent for the first 100 years, then steadily declined from a high of 39.7 percent in 1940 to a low of 9.2 percent in 1997. The proportion leveled off at around 10 percent over the 28-year period from 1969 through 1997.

a. Changes in U.S. milk cow inventories, 1850-1997\*:

Year	Milk Cows (1,000 Head)	All Cattle & Calves (1,000 Head)	Milk Cows as Percent of All Cattle & Calves
1850	6,385	18,379	34.7
1860	8,586	25,620	33.5
1870	8,935	23,821	37.5
1880	12,443	39,676	31.4
1890	16,512	57,649	28.6
1900	17,136	67,719	25.3
1910	17,125	61,804	27.7
1920	19,675	66,640	29.5
1930	20,499	63,896	32.1
1940	24,074	60,675	39.7
1950	21,233	76,762	27.7
1959	16,522	92,534	17.9
1969	11,174	106,346	10.5
1978	10,222	103,886	9.8
1987	10,085	95,847	10.5
1992	9,492	96,136	9.9
1997	9,095	98,989	9.2

\* Census of Agriculture, data for 1850-1950. Excludes Alaska and Hawaii.

Each year, the USDA's National Agricultural Statistics Service (NASS) surveys a random sample of producers to provide national estimates of animal populations and food production. This section reports NASS' demographics of the U.S. dairy industry as estimated from its January surveys from 1992 through 2002.

The following tables show changes over the past 10 years in numbers of milk cows and operations, size of operations, and milk production. The period is characterized by a continued year-to-year decline in number of milk cows, with a 6.4 percent drop over the 10 years. Replacement numbers have remained rather stable.

b. Changes in the U.S. dairy inventory

Year	Milk Cows that Have Calved				Milk Cow Replacement Heifers			
	1,000 Head	Percent Previous Year	Percent of 1992	Percent of 1996	1,000 Head	Percent Previous Year	Percent of 1992	Percent of 1996
1992	9,728.2	97.6	100.0	—	4,131.4	100.9	100.0	—
1993	9,658.1	99.3	99.3	—	4,176.2	101.1	101.1	—
1994	9,507.0	98.4	97.7	—	4,124.5	98.8	99.8	—
1995	9,481.8	99.7	97.5	—	4,121.3	99.9	99.8	—
1996	9,419.9	99.3	96.8	100.0	4,090.3	99.2	99.0	100.0
1997	9,317.9	98.9	95.8	98.9	4,058.4	99.2	98.2	99.2
1998	9,199.0	98.7	94.6	97.7	3,985.7	98.2	96.5	97.4
1999	9,133.0	99.3	93.9	97.0	4,068.8	102.1	98.5	99.5
2000	9,189.8	100.6	94.5	97.6	3,999.7	98.3	96.8	97.8
2001	9,182.7	99.9	94.4	97.5	4,057.0	101.4	98.2	99.2
2002	9,109.6	99.2	93.6	96.7	4,060.2	100.1	98.3	99.3

\*National Agricultural Statistics (NASS) data.

## 2. Number of dairy operations and herd size

Almost one in two dairy operations have disappeared since 1991, with roughly a 4- to 5-percent decrease per year. Combined with the relatively slower decline in milk cow numbers, the result is nearly a 73 percent increase in average herd size.

### a. Changes in the Number of U.S. Dairy Operations 1991-2001\*:

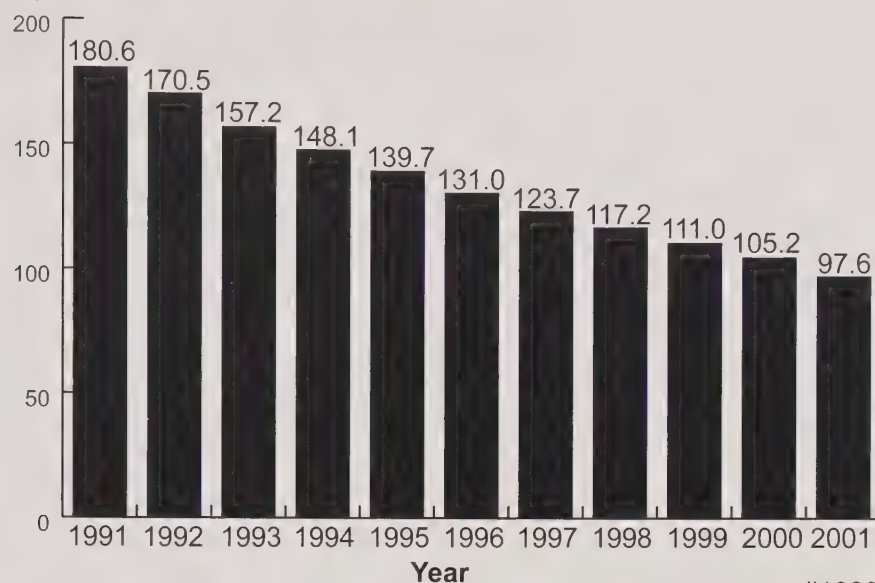
Year	Number	Percent Previous Year	Percent of 1991	Percent of 1995
1991	180,640	93.8	100.0	—
1992	170,500	94.4	94.4	—
1993	157,150	92.2	87.0	—
1994	148,140	94.3	82.0	—
1995	139,670	94.3	77.3	100.0
1996	130,980	93.8	72.5	93.8
1997	123,700	94.4	68.5	88.6
1998	117,180	94.7	64.9	83.9
1999	111,000	94.7	61.4	79.5
2000	105,170	94.7	58.2	75.3
2001	97,560	92.8	54.0	69.9

\* National Agricultural Statistics Service (NASS) data. An operation is any place having one or more milk cows, excluding cows used to nurse calves, on hand any time during the year.



### Number of U.S. Dairy Operations, 1991 to 2001

Number  
(Thousands)



#1029

The percentage of the smallest herds has consistently diminished each year, while the percentage of larger herds has consistently increased.

b. Percentage of U.S. dairy operations by herd size, 1991-2001.\*

Year	1-29 Head	30-49 Head	50-99 Head	100-199 Head	200 or More Head
1991	39.8	22.8	25.9	11.5**	**
1992	38.9	22.1	26.0	13.0**	**
1993	37.3	22.2	26.8	9.3	4.4
1994	36.1	22.0	27.4	9.8	4.7
1995	34.5	22.2	28.1	10.2	5.0
1996	32.9	22.3	28.7	10.7	5.4
1997	31.6	22.1	29.0	11.3	6.0
1998	30.9	21.7	29.0	11.9	6.5
1999	29.6	21.7	29.7	11.9	7.1
2000	29.3	21.0	29.8	12.2	7.7
2001	28.9	20.4	29.9	12.6	8.2

\* National Agricultural Statistics Service (NASS) data.

\*\* The 100-199 size group includes 200 or more head.

Over this 10-year period, a larger percentage of the U.S. inventory has shifted to large herds.

c. Percentage of U.S. milk cow inventory by herd size, 1991-2001:\*

<b>Year</b>	<b>1-29 Head</b>	<b>30-49 Head</b>	<b>50-99 Head</b>	<b>100-199 Head</b>	<b>200 or More Head</b>
1991	6.3	16.6	31.7	45.4**	**
1992	5.5	15.2	30.0	49.3**	**
1993	5.0	14.8	29.2	19.2	31.8
1994	4.6	14.0	28.7	19.3	33.4
1995	4.0	13.0	28.0	20.0	35.0
1996	4.0	12.0	27.0	20.0	37.0
1997	3.5	11.5	26.0	20.0	39.0
1998	3.5	10.5	24.2	19.3	42.5
1999	3.1	10.1	23.2	18.4	45.2
2000	2.9	9.1	22.0	18.0	48.0
2001	2.6	8.1	20.9	17.4	51.0

\* National Agricultural Statistics Service (NASS) data.

\*\* The 100-199 size group includes 200 or more head.

### 3. Milk production

From 1991 to 2001, total annual U.S. milk production increased 11.9 percent. This increase was achieved with a concurrent 7.2 percent decline in number of milk cows and a 20.7 percent increase in milk production per cow.

#### a. Changes in the U.S. Production 1991-2001\*:

Year	Milk Per Cow					Total Milk Production			
	Average Number of Milk Cows** (1,000 Head)	Pounds Per Cow	Percent Previous Year	Percent of 1991	Percent of 1995	Total Milk*** (Million Pounds)	Percent Previous Year	Percent of 1991	Percent of 1995
1991	9,826	15,031	101.7	100.0	–	147,697	100.0	100.0	–
1992	9,688	15,574	103.6	103.6	–	150,885	102.2	102.2	–
1993	9,581	15,722	101.0	104.6	–	150,636	99.8	102.0	–
1994	9,494	16,179	102.9	107.6	–	153,602	102.0	104.0	–
1995	9,466	16,405	101.4	109.1	100.0	155,292	101.1	105.1	100.0
1996	9,372	16,433	100.2	109.3	100.2	154,006	99.2	104.3	99.2
1997	9,252	16,871	102.7	112.2	102.8	156,091	101.4	105.7	100.5
1998	9,154	17,189	101.9	114.4	104.8	157,348	100.8	106.5	101.3
1999	9,156	17,772	103.4	118.2	108.3	162,716	103.4	110.2	104.8
2000	9,206	18,201	102.4	121.1	110.9	167,559	103.0	113.4	107.9
2001	9,115	18,139	99.7	120.7	110.6	165,336	98.7	111.9	106.5

\*National Agricultural Statistics (NASS) data.

\*\*Average Number during the year, excluding heifers not yet fresh.

\*\*\*Excluding milk nursed by calves.



## B. Changes in World Dairy Production

The number of milk cows in 2001 for the 26 selected countries declined 7.2 percent from 1991. Most of the decline occurred since 1995. From 1991 to 2001, milk production increased 2.5 percent. The last 3 years have all shown slight increases.

a. Changes in number of milk cows and milk production in selected countries, 1991-2001\*:

Year	Milk Cows				Total Milk Production			
	1,000 Head	Percent Previous Year	Percent of 1991	Percent of 1995	1,000 Metric Tons	Percent Previous Year	Percent of 1991	Percent of 1995
1991	132,438	NA	100.0	—	369,370	NA	100.0	—
1992	133,610	100.9	100.9	—	363,830	98.5	98.5	—
1993	132,412	99.1	100.0	—	364,336	100.1	98.6	—
1994	132,168	99.8	99.8	—	366,408	100.6	99.2	—
1995	132,137	100.0	99.8	100.0	367,267	100.2	99.4	100.0
1996	129,808	98.2	98.0	98.2	368,424	100.3	99.7	100.3
1997	128,452	99.0	97.0	97.2	365,593	99.2	99.0	99.5
1998	127,243	99.1	96.1	96.3	368,429	100.8	99.7	100.3
1999	125,335	98.5	94.6	94.9	372,037	101.0	100.7	101.3
2000	123,926	98.9	93.6	93.8	377,106	101.4	102.1	102.7
2001	122,920	99.2	92.8	93.0	378,527	100.4	102.5	103.1

\*USDA: Foreign Agriculture Service (FAS) data cover 26 countries.

## b. Changes in milk cow inventories in selected countries\*:

		Number of Milk Cows (1,000 Head)				
Continent/Country		1991	1995	2001	2001 as Percent of 1991	2001 as Percent of 1995
North America	Canada	1,410	1,245	1,136	80.6	91.2
	Mexico	6,440	6,440	6,800	105.6	105.6
	United States	9,826	9,466	9,125	92.9	96.4
	Subtotal:	17,676	17,151	17,061	96.5	99.5
South America	Argentina	2,000	2,350	2,450	122.5	104.3
	Brazil	15,500	17,500	16,045	103.5	91.7
	Chile	645	770	610	94.6	79.2
	Peru	563	580	610	108.3	105.2
	Venezuela	672	660	730	108.6	110.6
	Subtotal:	19,380	21,860	20,445	105.5	93.5
European Union	Denmark	769	703	644	83.7	91.6
	France	5,200	4,754	4,412	84.8	92.8
	Germany	6,016	5,273	4,564	75.9	86.6
	Ireland	1,387	1,269	1,238	89.3	97.6
	Italy	2,881	2,167	2,125	73.8	98.1
	Netherlands	1,775	1,709	1,425	80.3	83.4
	Spain	1,650	1,351	1,160	70.3	85.9
	Sweden	505	482	420	83.2	87.1
	United Kingdom	2,365	2,641	2,250	95.1	85.2
	Subtotal:	22,548	20,349	18,238	80.9	89.6
Eastern Europe	Poland	4,707	3,715	3,047	64.7	82.0
	Romania	1,600	1,778	1,560	97.5	87.7
	Subtotal:	6,307	5,493	4,607	73.0	83.9
Former Soviet Union	Russia	20,557	18,400	12,500	60.8	67.9
	Ukraine	8,378	7,818	5,375	64.2	68.8
	Subtotal:	28,935	26,218	17,875	61.8	68.2
South Asia	India**	30,700	33,000	35,900	116.9	108.8
	Subtotal:	30,700	33,000	35,900	116.9	108.8
Asia	China	1,459	2,252	2,348	160.9	104.3
	Japan	1,081	1,034	971	89.8	93.9
	Subtotal:	2,540	3,286	3,319	130.7	101.0
Oceania	Australia***	1,629	1,786	2,206	135.4	123.5
	New Zealand****	2,723	2,994	3,269	120.1	109.2
	Subtotal:	4,352	4,780	5,475	125.8	114.5
TOTAL		132,438	132,137	122,920	92.8	93.0

\* USDA: Foreign Agriculture Service (FAS) data cover 26 countries; U.S. average number milk cows during the year; FAS, Dairy Livestock and Poultry Division (202) 720-3761. Data from counselor/attached reports and official statistics.

\*\*Year beginning April 1 of year shown.

\*\*\*Year ending June 30 of year shown.

\*\*\*\*Year ending May 31 of year shown.

## c. Changes in milk production in selected countries\*:

Milk Production (1,000 Metric Tons)						
Continent/Country		1991	1995	2001	2001 as Percent of 1991	2001 as Percent of 1995
North America	Canada	7,790	7,920	8,250	105.9	104.2
	Mexico	10,200	11,120	9,485	93.0	85.3
	United States	66,994	70,599	75,075	112.1	106.3
	Subtotal:	84,984	89,639	92,810	109.2	103.5
South America	Argentina	6,400	8,300	9,600	150.0	115.7
	Brazil	14,200	17,400	22,580	159.0	129.8
	Chile	1,490	2,025	2,100	140.9	103.7
	Peru	645	665	1,100	170.5	165.4
	Venezuela	1,505	1,300	1,300	86.4	100.0
	Subtotal:	24,240	29,690	36,680	151.3	123.5
European Union	Denmark	4,640	4,673	4,660	100.4	99.7
	France	25,700	25,491	24,875	96.8	97.6
	Germany	28,916	28,800	27,886	96.4	96.8
	Ireland	5,539	5,689	5,416	97.8	95.2
	Italy	11,400	10,400	10,600	93.0	101.9
	Netherlands	11,047	11,294	11,200	101.4	99.2
	Spain	6,100	5,800	6,600	108.2	113.8
	Sweden	3,220	3,250	3,300	102.5	101.5
	United Kingdom	14,503	14,700	14,350	98.9	97.6
	Subtotal:	111,065	110,097	108,887	98.0	98.9
Eastern Europe	Poland	14,504	11,410	12,000	82.7	105.2
	Romania	4,391	5,885	5,020	114.3	85.3
	Subtotal:	18,895	17,295	17,020	90.1	98.4
Former Soviet Union	Russia	51,971	39,400	32,100	61.8	81.5
	Ukraine	22,409	17,050	13,100	58.5	76.8
	Subtotal:	74,380	56,450	45,200	60.8	80.1
South Asia	India**	28,200	32,000	36,400	129.1	113.7
	Subtotal:	28,200	32,000	36,400	129.1	113.7
Asia	China	4,646	5,600	8,660	186.4	154.6
	Japan	8,260	8,382	8,300	100.5	99.0
	Subtotal:	12,906	13,982	16,960	131.4	121.3
Oceania	Australia***	6,578	8,430	10,865	165.2	128.9
	New Zealand****	8,122	9,684	13,705	168.7	141.5
	Subtotal:	14,700	18,114	24,570	167.1	135.6
TOTAL		369,370	367,267	378,527	102.5	103.1

\*USDA: Foreign Agriculture Service (FAS) data cover 26 countries; FAS, Dairy Livestock and Poultry Division (202) 720-3761. Data from counselor/attached reports and official statistics.

\*\*Year beginning April 1 of year shown.

\*\*\*Year ending June 30 of year shown.

\*\*\*\*Year ending May 31 of year shown.



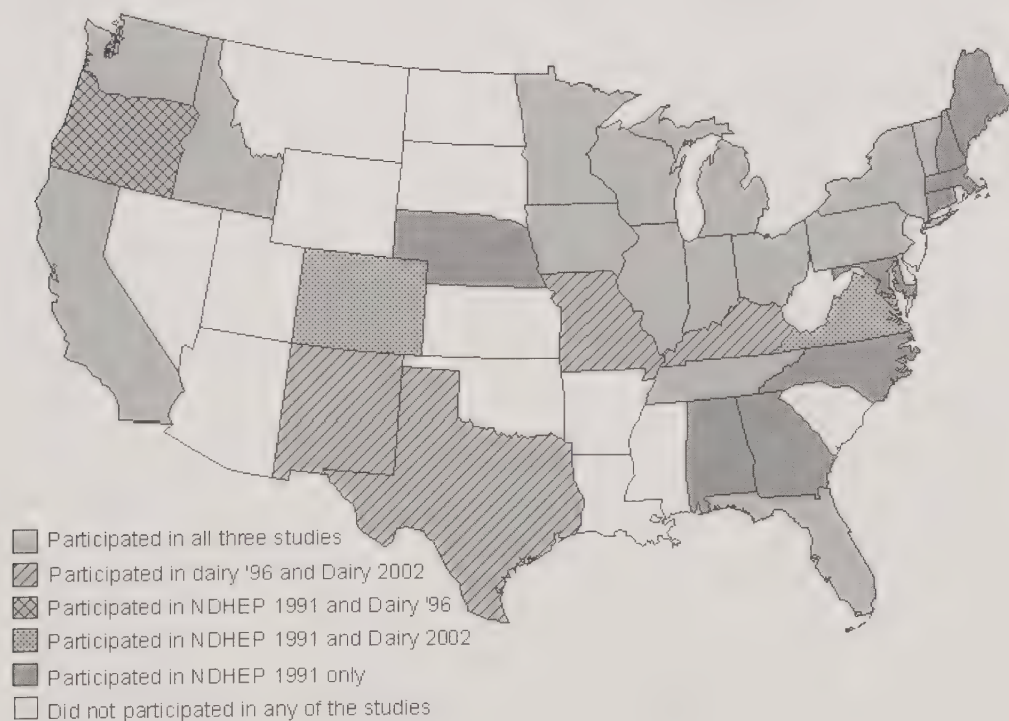
### C. Dairy Industry Changes by State

The following tables describe U.S. dairy industry changes by State between 1991 and 2002, based on USDA: National Agricultural Statistics Service data. The tables also identify which States were in the three NAHMS national dairy studies: the 1991 National Dairy Heifer Evaluation Project (NDHEP); Dairy '96; and Dairy 2002.

Among the geographical shifts shown is a consistent increase in number of milk cows in the Western States, notably California, Colorado, Idaho, and New Mexico. Also seen is a reduction in the number of milk cows in most other States. Individual State results echo national trends in reduction of number of operations, except in Alaska, and increases in milk production per cow, except in Alaska and Missouri. Note also the large increases in herd size for most Western States.

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#### States Participating in NAHMS Dairy Studies, 1991, 1996, 2002



## a. Changes in milk cow inventories by State (NASS data):

Study Participation				Number of Milk Cows that Calved (1,000 Head) January 1				
State	NDHEP (Y=Yes)	Dairy '96 (Y=Yes)	Dairy '02 (Y=Yes)	1992	1996	2002	2002 as Percent of 1992	2002 as Percent of 1996
Alabama	Y			43	32	20	46.5	62.5
Alaska				0.8	0.8	1.2	150.0	150.0
Arizona				96	118	140	145.8	118.6
Arkansas				69	58	33	47.8	56.9
California	Y	Y	Y	1,160	1,320	1,620	139.7	122.7
Colorado	Y		Y	77	82	91	118.2	111.0
Connecticut	Y			33	31	24	72.7	77.4
Delaware				9	10	9	100.0	90.0
Florida	Y	Y	Y	179	155	152	84.9	98.1
Georgia	Y			105	98	86	81.9	87.8
Hawaii				10	10	7	70.0	70.0
Idaho	Y	Y	Y	178	245	377	211.8	153.9
Illinois	Y	Y	Y	170	145	115	67.6	79.3
Indiana	Y	Y	Y	145	140	154	106.2	110.0
Iowa	Y	Y	Y	270	245	205	75.9	83.7
Kansas				95	83	95	100.0	114.5
Kentucky		Y	Y	185	160	125	67.6	78.1
Louisiana				79	72	54	68.4	75.0
Maine	Y			41	40	38	92.7	95.0
Maryland	Y			95	91	81	85.3	89.0
Massachusetts	Y			31	27	21	67.7	77.8
Michigan	Y	Y	Y	332	326	297	89.5	91.1
Minnesota	Y	Y	Y	660	585	500	75.8	85.5
Mississippi				60	53	34	56.7	64.2
Missouri		Y	Y	210	185	140	66.7	75.7
Montana				24	20	19	79.2	95.0
Nebraska	Y			90	70	68	75.6	97.1
Nevada				20	23	25	125.0	108.7
New Hampshire	Y			21	20	18	85.7	90.0
New Jersey				24	23	13	54.2	56.5
New Mexico		Y	Y	101	195	290	287.1	148.7
New York	Y	Y	Y	740	700	675	91.2	96.4
North Carolina	Y			99	84	66	66.7	78.6
North Dakota				80	63	42	52.5	66.7
Ohio	Y	Y	Y	320	285	260	81.3	91.2
Oklahoma				97	94	87	89.7	92.6
Oregon	Y	Y		100	95	105	105.0	110.5
Pennsylvania	Y	Y	Y	663	636	588	88.7	92.5
Rhode Island	Y			2.4	2.1	1.4	58.3	66.7
South Carolina				33	26	20	60.6	76.9
South Dakota				132	115	98	74.2	85.2
Tennessee	Y	Y	Y	165	120	90	54.5	75.0
Texas		Y	Y	385	400	310	80.5	77.5
Utah				76	90	93	122.4	103.3
Vermont	Y	Y	Y	163	157	154	94.5	98.1
Virginia	Y		Y	140	128	120	85.7	93.8
Washington	Y	Y	Y	238	260	247	103.8	95.0
West Virginia				23	21	16	69.6	76.2
Wisconsin	Y	Y	Y	1,650	1,475	1,280	77.6	86.8
Wyoming				9	6	5	55.6	83.3
U.S.				9,728.2	9,419.9	9,109.6	93.6	96.7

## b. Changes in number of operations with milk cows, by State (NASS data):

Number of Operations with Milk Cows					
State	1991	1995	2001	2001 as Percent of 1991	2001 as Percent of 1995
Alabama	1,100	510	250	22.7	49.0
Alaska	30	30	30	100.0	100.0
Arizona	500	300	250	50.0	83.3
Arkansas	2,000	1,700	900	45.0	52.9
California	4,200	3,300	2,500	59.5	75.8
Colorado	1,400	1,000	800	57.1	80.0
Connecticut	500	380	310	62.0	81.6
Delaware	160	150	120	75.0	80.0
Florida	1,000	800	510	51.0	63.8
Georgia	1,400	1,100	770	55.0	70.0
Hawaii	80	60	50	62.5	83.3
Idaho	1,900	1,500	1,000	52.6	66.7
Illinois	3,000	2,600	1,900	63.3	73.1
Indiana	4,500	3,900	2,900	64.4	74.4
Iowa	7,000	5,200	3,500	50.0	67.3
Kansas	2,300	1,600	1,200	52.2	75.0
Kentucky	5,500	4,000	2,900	52.7	72.5
Louisiana	1,800	1,100	610	33.9	55.5
Maine	1,100	750	600	54.5	80.0
Maryland	1,600	1,100	950	59.4	86.4
Massachusetts	800	500	350	43.8	70.0
Michigan	6,000	4,700	3,300	55.0	70.2
Minnesota	15,000	12,000	7,800	52.0	65.0
Mississippi	1,300	800	480	36.9	60.0
Missouri	6,900	5,000	3,700	53.6	74.0
Montana	1,600	900	650	40.6	72.2
Nebraska	2,700	1,800	1,100	40.7	61.1
Nevada	260	200	150	57.7	75.0
New Hampshire	400	400	260	65.0	65.0
New Jersey	450	400	250	55.6	62.5
New Mexico	1,300	900	500	38.5	55.6
New York	12,200	10,000	7,200	59.0	72.0
North Carolina	1,800	1,300	900	50.0	69.2
North Dakota	2,100	1,500	850	40.5	56.7
Ohio	8,900	6,800	5,200	58.4	76.5
Oklahoma	3,000	2,400	1,700	56.7	70.8
Oregon	1,900	1,300	820	43.2	63.1
Pennsylvania	14,500	11,800	10,300	71.0	87.3
Rhode Island	60	40	30	50.0	75.0
South Carolina	800	350	240	30.0	68.6
South Dakota	3,300	2,400	1,300	39.4	54.2
Tennessee	3,500	2,600	1,500	42.9	57.7
Texas	5,300	4,000	2,100	39.6	52.5
Utah	1,500	1,000	760	50.7	76.0
Vermont	2,600	2,100	1,600	61.5	76.2
Virginia	2,800	2,100	1,500	53.6	71.4
Washington	3,000	1,800	1,000	33.3	55.6
West Virginia	2,000	1,100	600	30.0	54.5
Wisconsin	33,000	28,000	19,100	57.9	68.2
Wyoming	600	400	270	45.0	67.5
U.S.	180,640	139,670	97,560	54.0	69.9



## c. Changes in average herd size, by State (NASS data):

State	Study Participation			Average Herd Size (Number of Milk Cows)				
	NDHEP (Y=Yes)	Dairy '96 (Y=Yes)	Dairy '02 (Y=Yes)	1991	1995	2001	2001 as Percent of 1991	2001 as Percent of 1995
Alabama	Y			39.1	62.7	80.0	204.6	127.6
Alaska				26.7	26.7	40.0	149.8	149.8
Arizona				192.0	393.3	560.0	291.7	142.4
Arkansas				34.5	34.1	36.7	106.4	107.6
California	Y	Y	Y	276.2	400.0	648.0	234.6	162.0
Colorado	Y		Y	55.0	82.0	113.8	206.9	138.8
Connecticut	Y			66.0	81.6	77.4	117.3	94.9
Delaware				56.3	66.7	75.0	133.2	112.4
Florida	Y	Y	Y	179.0	193.8	298.0	166.5	153.8
Georgia	Y			75.0	89.1	111.7	148.9	125.4
Hawaii				125.0	166.7	140.0	112.0	84.0
Idaho	Y	Y	Y	93.7	163.3	377.0	402.3	230.9
Illinois	Y	Y	Y	56.7	55.8	60.5	106.7	108.4
Indiana	Y	Y	Y	32.2	35.9	53.1	164.9	147.9
Iowa	Y	Y	Y	38.6	47.1	58.6	151.8	124.4
Kansas				41.3	51.9	79.2	191.8	152.6
Kentucky		Y	Y	33.6	40.0	43.1	128.3	107.8
Louisiana				43.9	65.5	88.5	201.6	135.1
Maine	Y			37.3	53.3	63.3	169.7	118.8
Maryland	Y			59.4	82.7	85.3	143.6	103.1
Massachusetts	Y			38.8	54.0	60.0	154.6	111.1
Michigan	Y	Y	Y	55.3	69.4	90.0	162.7	129.7
Minnesota	Y	Y	Y	44.0	48.8	64.1	145.7	131.4
Mississippi				46.2	66.3	70.8	153.2	106.8
Missouri		Y	Y	30.4	37.0	37.8	124.3	102.2
Montana				15.0	22.2	29.2	194.7	131.5
Nebraska	Y			33.3	38.9	61.8	185.6	158.9
Nevada				76.9	115.0	166.7	216.8	145.0
New Hampshire	Y			52.5	50.0	69.2	131.8	138.4
New Jersey				53.3	57.5	52.0	97.6	90.4
New Mexico		Y	Y	77.7	216.7	580.0	746.5	267.7
New York	Y	Y	Y	60.7	70.0	93.8	154.5	134.0
North Carolina	Y			55.0	64.6	73.3	133.3	113.5
North Dakota				38.1	42.0	49.4	129.7	117.6
Ohio	Y	Y	Y	36.0	41.9	50.0	138.9	119.3
Oklahoma				32.3	39.2	51.2	158.5	130.6
Oregon	Y	Y		52.6	73.1	128.0	243.3	175.1
Pennsylvania	Y	Y	Y	45.7	53.9	57.1	124.9	105.9
Rhode Island	Y			40.0	52.5	46.7	116.8	89.0
South Carolina				41.3	74.3	83.3	201.7	112.1
South Dakota				40.0	47.9	75.4	188.5	157.4
Tennessee	Y	Y	Y	47.1	46.2	60.0	127.4	129.9
Texas		Y	Y	72.6	100.0	147.6	203.3	147.6
Utah				50.7	90.0	122.4	241.4	136.0
Vermont	Y	Y	Y	62.7	74.8	96.3	153.6	128.7
Virginia	Y		Y	50.0	61.0	80.0	160.0	131.1
Washington	Y	Y	Y	79.3	144.4	247.0	311.4	171.1
West Virginia				11.5	19.1	26.7	232.2	139.8
Wisconsin	Y	Y	Y	50.0	52.7	67.0	134.0	127.1
Wyoming				15.0	15.0	18.5	123.3	123.3
U.S.				53.9	67.4	93.4	173.3	138.6

## d. Changes in milk per cow, by State (NASS data):

Milk Per Cow (Pounds)					
State	1991	1995	2001	2001 as Percent of 1991	2001 as Percent of 1995
Alabama	12,707	14,176	14,286	112.4	100.8
Alaska	13,300	17,000	13,055	98.2	76.8
Arizona	18,032	19,735	20,679	114.7	104.8
Arkansas	11,687	12,150	12,343	105.6	101.6
California	18,534	19,573	20,913	112.8	106.8
Colorado	17,338	18,687	21,648	124.9	115.8
Connecticut	15,848	16,438	18,240	115.1	111.0
Delaware	14,130	14,500	16,778	118.7	115.7
Florida	13,933	14,698	15,758	113.1	107.2
Georgia	13,523	15,550	16,640	123.0	107.0
Hawaii	13,056	13,654	14,107	108.0	103.3
Idaho	16,399	18,147	21,194	129.2	116.8
Illinois	14,936	15,887	17,414	116.6	109.6
Indiana	15,439	15,375	16,732	108.4	108.8
Iowa	15,095	16,124	18,024	119.4	111.8
Kansas	12,680	14,390	17,312	136.5	120.3
Kentucky	11,231	12,469	12,969	115.5	104.0
Louisiana	11,675	11,908	11,704	100.2	98.3
Maine	14,786	16,025	17,211	116.4	107.4
Maryland	14,480	14,725	15,780	109.0	107.2
Massachusetts	15,000	16,000	17,048	113.7	106.6
Michigan	15,690	17,071	19,323	123.2	113.2
Minnesota	14,354	15,894	17,278	120.4	108.7
Mississippi	12,098	12,909	14,200	117.4	110.0
Missouri	13,451	14,158	13,441	99.9	94.9
Montana	13,750	15,000	18,211	132.4	121.4
Nebraska	13,913	14,797	16,056	115.4	108.5
Nevada	17,500	18,128	19,400	110.9	107.0
New Hampshire	15,143	16,300	17,944	118.5	110.1
New Jersey	14,160	13,913	16,643	117.5	119.6
New Mexico	19,561	18,969	20,750	106.1	109.4
New York	15,005	16,501	17,527	116.8	106.2
North Carolina	15,424	16,314	17,373	112.6	106.5
North Dakota	12,622	13,094	14,000	110.9	106.9
Ohio	14,446	15,917	16,612	115.0	104.4
Oklahoma	12,354	13,611	14,528	117.6	106.7
Oregon	16,590	17,289	18,074	108.9	104.5
Pennsylvania	15,263	16,492	18,112	118.7	109.8
Rhode Island	14,333	14,773	16,571	115.6	112.2
South Carolina	12,273	14,481	17,476	142.4	120.7
South Dakota	12,309	13,398	15,960	129.7	119.1
Tennessee	11,863	13,740	14,511	122.3	105.6
Texas	14,036	15,244	15,689	111.8	102.9
Utah	15,975	16,739	17,581	110.1	105.0
Vermont	14,683	16,210	17,431	118.7	107.5
Virginia	14,614	15,116	15,898	108.8	105.2
Washington	18,814	20,091	22,324	118.7	111.1
West Virginia	11,739	12,677	15,563	132.6	122.9
Wisconsin	14,140	15,397	17,182	121.5	111.6
Wyoming	12,563	13,197	14,000	111.4	106.1
U.S.	15,031	16,405	18,139	120.7	110.6

## Section II: Management, NAHMS Population Estimates

### A. General

#### 1. Breed

The main breed of dairy cattle on U.S. dairy operations changed very little since 1991. Holsteins remained the primary breed.

a. Percentage of operations by main breed of dairy herd:

Breed	1991 NDHEP*	Std. Error	Dairy '96	Std. Error	Dairy 2002	Std. Error
Holstein	94.9	(0.7)	93.0	(0.8)	92.4	(0.7)
Jersey	2.4	(0.4)	4.1	(0.6)	3.8	(0.5)
Ayrshire	0.6	(0.3)	0.3	(0.1)	0.3	(0.1)
Brown Swiss	1.0	(0.4)	0.4	(0.2)	0.9	(0.2)
Guernsey	0.9	(0.3)	1.7	(0.4)	1.1	(0.3)
Other	0.2	(0.2)	0.5	(0.2)	1.5	(0.4)
Total	100.0		100.0		100.0	

\*Population: Operations with at least 30 dairy cows.

#### 2. Registration

The percentage of operations with **no** registered dairy cows increased from 65.5 percent in 1995 to 71.6 percent in 2001. However, the percentage of operations with 100 percent of dairy cows registered remained the same (7.6 percent for 1995 and 2001).

a. Percentage of operations by percentage of dairy cows registered:

Percent of Dairy Cows Registered	1991 NDHEP*	Std. Error	Dairy '96	Std. Error	Dairy 2002	Std. Error
0	59.6	(1.7)	65.5	(1.2)	71.6	(1.2)
1-9	10.8	(1.1)	11.5	(0.7)	5.2	(0.6)
10-50	16.3	(1.3)	6.4	(0.6)	9.2	(0.8)
51-75	3.2	(0.6)	3.8	(0.6)	2.2	(0.4)
76-99	4.2	(0.6)	5.2	(0.5)	4.2	(0.5)
100	5.9	(0.7)	7.6	(0.7)	7.6	(0.7)
Total	100.0		100.0		100.0	

\*Population: Operations with at least 30 dairy cows.



Fewer operations reported using **no** individual animal identification in 2001 than in 1995 (6.3 percent and 8.8 percent, respectively). Ear tags remained the most common method of individual animal identification (85.8 percent of operations).

b. Percentage of operations by type(s) of individual animal identification method used:

Identification Type	Dairy '96	Standard Error	Dairy 2002	Standard Error
Ear tags	81.2	(1.1)	85.8	(1.0)
Collars	22.3	(1.0)	16.8	(1.0)
Photographs or sketches	17.4	(1.0)	14.1	(0.9)
Branding (all methods)	4.9	(0.5)	4.9	(0.5)
Implanted electronic ID	0.3	(0.1)	0.1	(0.1)
Tattoos (other than for brucellosis)	6.5	(0.6)	8.8	(0.7)
Other	10.1	(0.9)	10.8	(0.8)
None	8.8	(0.9)	6.3	(0.8)

### 3. Number of bulls

The percentage of operations **not** using bulls for breeding was nearly the same in 1995 and 2001 (45.4 percent and 45.1 percent, respectively).

a. Percentage of operations by number of bulls used for breeding dairy cattle in the January 1, 1996, and January 1, 2002, inventories:

Number Bulls	Dairy '96	Standard Error	Dairy 2002	Standard Error
0	45.4	(1.3)	45.1	(1.4)
1	34.8	(1.3)	31.1	(1.3)
2 to 4	16.9	(0.8)	19.1	(1.0)
5 or more	2.9	(0.2)	4.7	(0.3)
Total	100.0		100.0	

#### 4. Record keeping

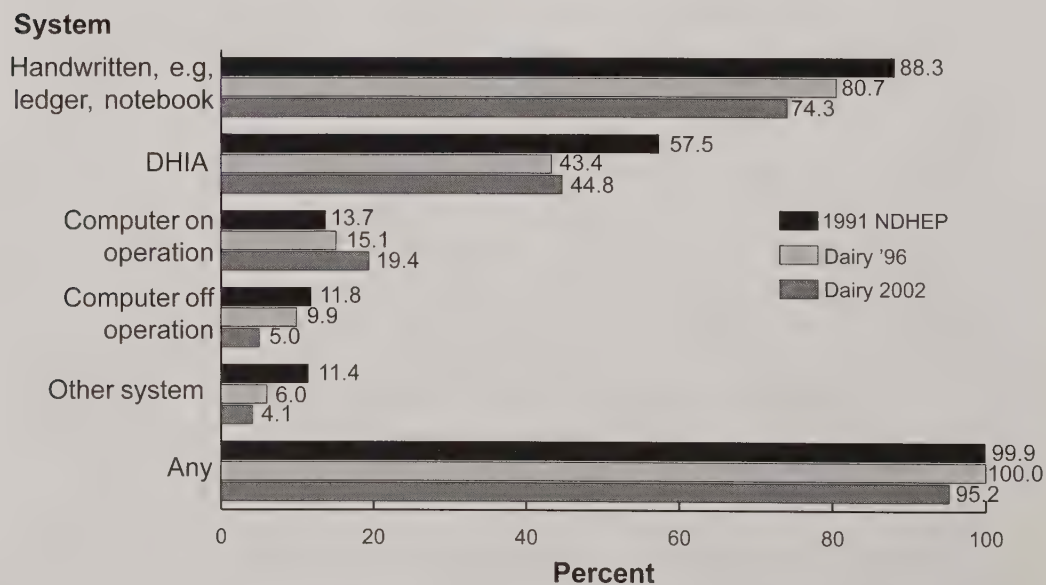
Between 1991 and 1996 there was a sharp decline in the percentage of operations that reported using Dairy Herd Improvement Association (DHIA) record-keeping systems. However, the percentage of operations using DHIA record-keeping systems remained the same between 1996 and 2001.

a. Percentage of operations by...

System	...type of record-keeping systems used for the dairy operation.		...type of individual animal record-keeping systems used.			
	1991 NDHEP*	Std. Error	Dairy '96	Std. Error	Dairy 2002	Std. Error
Handwritten, such as a ledger or notebook	88.3	(1.0)	80.7	(1.0)	74.3	(1.1)
Dairy Herd Improvement Association	57.5	(1.8)	43.4	(1.2)	44.8	(1.3)
Computer located on the operation	13.7	(1.1)	15.1	(0.8)	19.4	(0.9)
Computer located off the operation	11.8	(1.2)	9.9	(0.8)	5.0	(0.5)
Other system	11.4	(1.1)	6.0	(0.7)	4.1	(0.5)
Any	99.9	(0.1)	100.0	(0.0)	95.2	(0.6)

\*Population: Operations with at least 30 dairy cows.

#### Percent of Operations by Type of Individual Record-Keeping System Used



#1031

### 5. Feed rations

Overall, a higher percentage of operations fed a total mixed ration in 2001 than in 1995.

a. Percentage of operations that fed a total mixed ration, by herd size:

<b>Herd Size (Number Dairy Cows)</b>	<b>Dairy '96</b>	<b>Standard Error</b>	<b>Dairy 2002</b>	<b>Standard Error</b>
Less than 100	28.2	(1.3)	36.6	(1.6)
100 to 499	68.8	(2.0)	78.3	(1.7)
500 or more	84.1	(3.0)	90.2	(1.7)
All operations	35.6	(1.1)	47.0	(1.3)

i. Percentage of operations that fed a total mixed ration, by rolling herd average milk production:

<b>Average Pounds Milk</b>	<b>Dairy '96</b>	<b>Standard Error</b>	<b>Dairy 2002</b>	<b>Standard Error</b>
Less than 16,000	28.9	(2.0)	25.4	(2.3)
16,000 to 19,999	33.2	(1.7)	45.0	(2.2)
20,000 or more	55.4	(2.5)	65.7	(2.1)

Nearly three out of four (71.2 percent) operations used forage test results to balance feed rations in 2001, a negligible increase since 1995.

b. Percentage of operations that used forage test results to balance feed rations, by herd size:

<b>Herd Size (Number Dairy Cows)</b>	<b>Dairy '96</b>	<b>Standard Error</b>	<b>Dairy 2002</b>	<b>Standard Error</b>
Less than 100	64.1	(1.4)	66.1	(1.6)
100 to 499	84.8	(1.3)	87.1	(1.3)
500 or more	89.2	(2.7)	88.8	(1.8)
All operations	67.8	(1.2)	71.2	(1.2)

## 6. bST

Overall (and among all herd sizes) the use of bovine somatotropin (bST) increased. The overall percentage of cows that were given bST during the current lactation (at the time of interview) also increased between 1995 and 2001 (10.1 percent and 22.3 percent, respectively). Operations in the West region continued to lead the way in the use of bST, although roughly one out every five cows in each of the four regions were given bST.

a. Percentage of operations (and percentage of cows) that used bovine somatotropin (bST) in cows during the current lactation (at the time of interview), by herd size:

Herd Size (Number Dairy Cows)	Dairy '96 (All Dairy Cows in Inventory January 1)				Dairy 2002 (Dairy Cows Milked January 1)			
	Pct. Ops.	Std. Error	Pct. Cows	Std. Error	Pct. Ops.	Std. Error	Pct. Cows	Std. Error
Less than 100	6.5	(0.6)	3.7	(0.4)	8.8	(0.8)	6.2	(0.7)
100 to 499	21.0	(1.7)	13.2	(1.3)	32.2	(1.9)	24.5	(1.5)
500 or more	38.7	(3.9)	17.9	(2.3)	54.4	(2.6)	34.1	(1.8)
All operations	9.4	(0.6)	10.1	(0.7)	15.2	(0.8)	22.3	(0.8)

b. Percentage of operations (and percentage of cows on these operations) that used bovine somatotropin (bST) in cows during the current lactation (at the time of interview), by region<sup>1</sup>:

Region	Dairy '96				Dairy 2002			
	Pct. Ops.	Std. Error	Pct. Cows	Std. Error	Pct. Ops.	Std. Error	Pct. Cows	Std. Error
West	15.2	(2.6)	10.9	(1.6)	22.3	(1.8)	22.9	(1.6)
Midwest	7.6	(0.7)	8.3	(1.0)	14.8	(1.0)	23.9	(1.3)
Northeast	12.0	(1.2)	11.8	(1.1)	14.3	(1.5)	19.1	(1.5)
Southeast	8.3	(1.8)	13.6	(2.2)	14.1	(2.8)	17.8	(2.3)

<sup>1</sup> Regions

\* West: California, Colorado, Idaho, New Mexico, Oregon, Texas, Washington  
 Midwest: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin  
 Northeast: New York, Pennsylvania, Vermont

\* Southeast: Florida, Kentucky, Tennessee, Virginia

\*Colorado and Virginia did not participate in Dairy '96. Oregon did not participate in Dairy 2002.



## B. Productivity

### 1. Rolling herd average

From 1995 to 2001, rolling herd average (RHA) milk production (cow average) increased 2,012 pounds. This increase was slightly larger in herds where Holstein was the predominant breed.

a. Rolling herd average milk production (pounds):

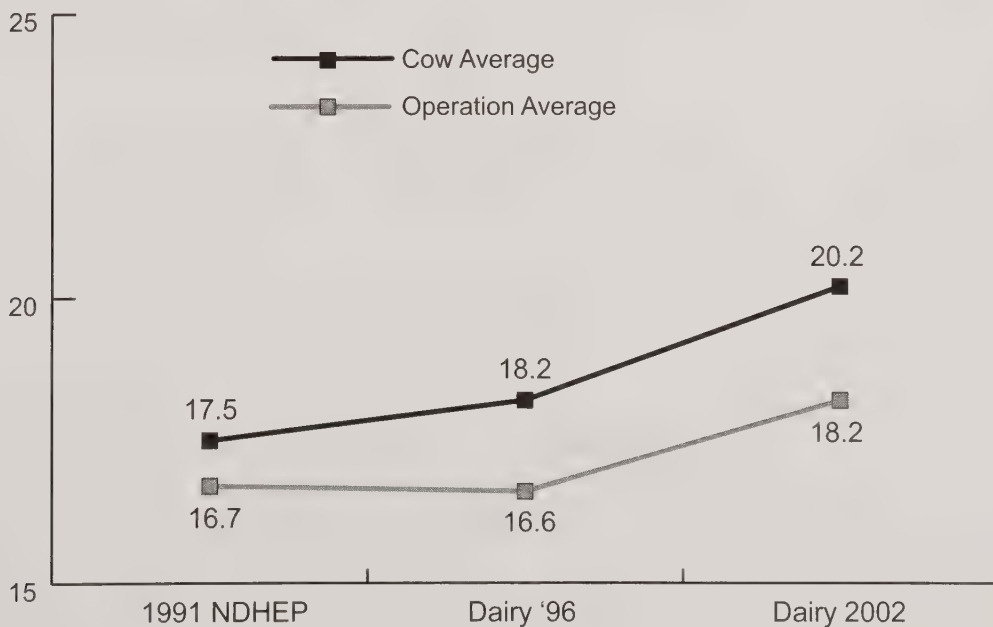
1991 NDHEP*				Dairy '96				Dairy 2002			
All Herds											
Op. Avg.	Std. Error	Cow Avg.	Std. Error	Op. Avg.	Std. Error	Cow Avg.	Std. Error	Op. Avg.	Std. Error	Cow Avg.	Std. Error
16,703	(96)	17,532	(81)	16,587	(100)	18,198	(79)	18,235	(103)	20,210	(80)
Primarily Holstein Herds**											
Op. Avg.	Std. Error	Cow Avg.	Std. Error	Op. Avg.	Std. Error	Cow Avg.	Std. Error	Op. Avg.	Std. Error	Cow Avg.	Std. Error
16,925	(96)	17,735	(80)	16,925	(99)	18,442	(78)	18,590	(102)	20,467	(79)

\* Population: Operations with at least 30 dairy cows.

\*\* Operations where Holstein accounted for 50 percent or more of the January 1, 1996, or the January 1, 2002, cow inventory or was the main breed of dairy herd (1991).

### Rolling Herd Average Milk Production

Thousand Pounds



## 2. Days dry

There was essentially no change from 1991 to 2001 in the average number of days dry (nonlactating days per cow) as reported by producers.

a. Average days cows were dry:

1991 NDHEP*				Dairy '96				Dairy 2002			
Op. Avg.	Std. Error	Cow Avg.	Std. Error	Op. Avg.	Std. Error	Cow Avg.	Std. Error	Op. Avg.	Std. Error	Cow Avg.	Std. Error
61.1	(0.5)	61.5	(0.3)	60.5	(0.3)	61.7	(0.4)	60.6	(0.3)	61.9	(0.2)

\* Population: Operations with at least 30 dairy cows.

## 3. Calving interval

The average calving interval increased slightly from an operation average of 12.9 months in 1995 to 13.3 months in 2001. It has been suggested that higher levels of production may be associated with lower levels of reproductive performance. The use of bST may extend lactations, and the high cost of replacement animals may decrease culling levels. Either of these factors could potentially result in longer calving intervals.

a. Average calving interval (months):

1991 NDHEP*				Dairy '96				Dairy 2002			
Op. Avg.	Std. Error	Cow Avg.	Std. Error	Op. Avg.	Std. Error	Cow Avg.	Std. Error	Op. Avg.	Std. Error	Cow Avg.	Std. Error
12.8	(0.0)	12.9	(0.0)	12.9	(0.0)	13.0	(0.0)	13.3	(0.0)	13.4	(0.0)

\* Population: Operations with at least 30 dairy cows.

## 4. Age at first calving

The operation average age at first calving remained essentially the same from 1991 to 2001.

a. Average age at first calving (months):

1991 NDHEP*				Dairy '96				Dairy 2002			
Oper. Avg.	Std. Error	Cow Avg.	Std. Error	Oper. Avg.	Std. Error	Cow Avg.	Std. Error	Oper. Avg.	Std. Error	Cow Avg.	Std. Error
25.9	(0.1)	25.8	(0.1)	25.8	(0.1)	25.5	(0.1)	25.4	(0.1)	25.0	(0.1)

\* Population: Operations with at least 30 dairy cows.

## C. Heifer Health

### 1. Prewaning mortality

There was essentially no change from 1995 to 2001 in either the overall mortality of preweaned calves or in mortality by specific causes. Scours and diarrhea still accounted for the largest percentage of deaths in preweaned calves, followed by respiratory problems.

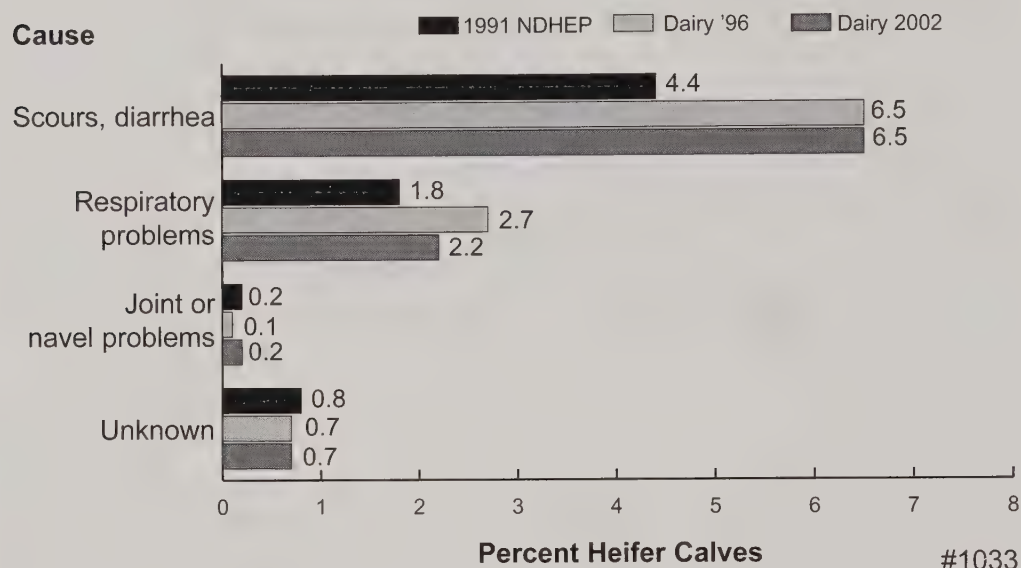
a. Number of unweaned heifer calf deaths by producer-perceived cause, as a percentage of heifer calves born alive...

Cause	1991 NDHEP* ...or moved onto the operation.		Dairy '96		Dairy 2002	
	Percent Heifer Calves	Std. Error	Percent Heifer Calves	Std. Error	Percent Heifer Calves	Std. Error
Scours, diarrhea	4.4	(0.4)	6.5	(0.2)	6.5	(0.2)
Respiratory problems	1.8	(0.1)	2.7	(0.1)	2.2	(0.1)
Joint or navel problems	0.2	(0.1)	0.1	(0.0)	0.2	(0.0)
Put down due to lameness or injury	NA	NA	0.1	(0.0)	0.1	(0.0)
Trauma	0.2	(0.1)	NA	NA	NA	NA
Lack of coordination/ severe depression	NA	NA	0.0	(0.0)	0.1	(0.0)
Poison	NA	NA	0.0	(0.0)	0.0	(0.0)
Calving problems	NA	NA	NA	NA	0.4	(0.1)
Other known	1.0	(0.2)	0.7	(0.1)	0.3	(0.0)
Unknown	0.8	(0.1)	0.7	(0.1)	0.7	(0.1)
Total	8.4	(0.4)	10.8	(0.4)	10.5	(0.3)

\*Population: Operations with at least 30 dairy cows.



### Number of Unweaned Heifer Calf Deaths by Producer-Perceived Cause, as a Percentage of Heifer Calves Born Alive



b. Percentage of total unweaned calf deaths by producer-perceived cause:

Cause	1991 NDHEP* ...or moved onto the operation		Dairy '96		Dairy 2002	
	Pct. Deaths	Std. Error	Pct. Deaths	Std. Error	Pct. Deaths	Std. Error
Scours, diarrhea	52.2	(2.6)	60.5	(1.2)	62.1	(1.1)
Respiratory problems	21.3	(1.6)	24.5	(1.0)	21.3	(0.9)
Joint or navel problems	2.2	(0.7)	1.0	(0.1)	1.7	(0.2)
Put down due to lameness or injury			0.6	(0.1)	0.5	(0.1)
Trauma	2.4	(0.8)	NA	NA	NA	NA
Lack of coordination/severe depression	NA	NA	0.4	(0.1)	0.4	(0.1)
Poison	NA	NA	0.3	(0.1)	0.1	(0.0)
Calving problems	NA	NA	NA	NA	4.1	(0.6)
Other known	11.7	(1.8)	6.4	(1.1)	2.9	(0.4)
Unknown	10.2	(1.4)	6.3	(0.9)	6.9	(0.8)
Total	100.0		100.0		100.0	

\*Population: Operations with at least 30 dairy cows.

## 2. Weaned heifer mortality

Weaned heifer mortality increased from 2.2 percent (1991) to 2.8 percent (2001) of the respective heifer inventories.

a. Number of weaned heifer deaths by producer-perceived cause as a percentage of heifer inventory (weaning age to calving):

Cause	1991 NDHEP*		Dairy '96		Dairy 2002	
	Pct. Heifers	Std. Error	Pct. Heifers	Std. Error	Pct. Heifers	Std. Error
Scours, diarrhea	0.4	(0.1)	0.3	(0.0)	0.3	(0.0)
Respiratory problems	0.8	(0.1)	1.1	(0.1)	1.4	(0.1)
Joint or navel problems	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Put down due to lameness or injury	NA	NA	0.1	(0.0)	0.2	(0.1)
Trauma	0.1	(0.0)	NA	NA	NA	NA
Lack of coordination/severe depression	NA	NA	0.0	(0.0)	0.0	(0.0)
Poison	NA	NA	0.0	(0.0)	0.0	(0.0)
Other known	0.5	(0.0)	0.4	(0.1)	0.3	(0.0)
Unknown	0.4	(0.0)	0.5	(0.0)	0.4	(0.0)
Total	2.2	(0.1)	2.4	(0.1)	2.8	(0.1)

\*Population: Operations with at least 30 dairy cows.

## b. Percentage of total weaned heifer deaths by producer-perceived cause:

Cause	1991 NDHEP*		Dairy '96		Dairy 2002	
	Pct. Deaths	Std. Error	Pct. Deaths	Std. Error	Pct. Deaths	Std. Error
Scours, diarrhea	18.4	(2.6)	14.1	(1.6)	12.3	(1.0)
Respiratory problems	34.8	(3.5)	44.8	(2.1)	50.4	(1.6)
Joint or navel problems	1.0	(0.4)	1.2	(0.5)	1.4	(0.3)
Put down due to lameness or injury	NA	NA	4.0	(0.5)	6.4	(0.6)
Trauma	6.7	(0.9)	NA	NA	NA	NA
Lack of coordination/severe depression	NA	NA	0.5	(0.1)	0.3	(0.1)
Poison	NA	NA	1.2	(0.3)	1.1	(0.4)
Other known	20.8	(2.0)	15.8	(2.4)	12.1	(1.2)
Unknown	18.3	(2.1)	18.4	(1.4)	16.0	(1.1)
Total	100.0		100.0		100.0	

\*Population: Operations with at least 30 dairy cows.



## D. Heifer Management

### 1. Separation from mothers

NAHMS' 1991 and 1996 studies showed a dramatic change in the routine timing of heifer separation from the dam. The change may be attributed to a wording difference from one survey to another, but it is more likely that it occurred because of the impact of dairy educators.

Although the trend toward removing newborn calves before any nursing occurs continued between 1995 and 2001 (47.9 percent of operations and 52.9 percent of operations, respectively) many producers still allow calves to nurse from the dams.

a. Percentage of operations by age at which newborn calves were separated from their mothers:

Age	1991 NDHEP*	Std. Error	Question Variation	Dairy '96	Std. Error	Dairy 2002	Std. Error
0 hours (before any nursing)	28.0	(1.7)	Immediately (no nursing)	47.9	(1.3)	52.9	(1.3)
Less than 12 hours	39.6	(1.7)	After nursing, but less than 12 hours	20.8	(1.0)	22.5	(1.1)
12-24 hours	22.0	(1.4)		17.4	(1.1)	15.9	(1.0)
More than 24 hours	10.4	(1.0)		13.9	(1.0)	8.7	(0.8)
Total	100.0			100.0		100.0	

\*Population: Operations with at least 30 dairy cows.

## 2. First colostrum feeding management

Approximately one-third of operations still rely on first nursing for colostrum delivery to calves.

a. Percentage of operations by method of feeding first colostrum to newborn heifers:

Age	1991 NDHEP*	Std. Error	Dairy '96	Std. Error	Dairy 2002	Std. Error
First nursing	33.7	(1.7)	33.5	(1.2)	30.5	(1.2)
Hand-feeding from bucket or bottle	64.0	(1.7)	62.5	(1.2)	64.8	(1.3)
Hand-feeding using esophageal feeder	2.3	(0.6)	3.6	(0.4)	4.4	(0.5)
No colostrum	0.0	(0.0)	0.4	(0.2)	0.3	(0.1)
Total	100.0		100.0		100.0	

\*Population: Operations with at least 30 dairy cows.

From 1991 to 2001, there was basically no change in the amount of colostrum being hand-fed to newborn calves. In all three NAHMS' dairy studies, most operations reported that calves received more than 2 quarts but less than 4 quarts of colostrum in the first 24 hours of life.

b. Percentage of operations by amount of first colostrum hand-fed to newborn heifers in the first 24 hours.

Amount	1991 NDHEP*	Std. Error	Dairy '96	Std. Error	Dairy 2002	Std. Error
2 quarts or less	25.6	(1.8)	21.4	(1.3)	21.4	(1.4)
More than 2 but less than 4 quarts	48.2	(2.1)	46.6	(1.6)	47.2	(1.7)
4 or more quarts	26.2	(1.9)	32.0	(1.5)	31.4	(1.5)
Total	100.0		100.0		100.0	

\*Population: Operations with at least 30 dairy cows.

### 3. Weaning age

From 1991 to 1995, the operation average age at weaning increased slightly (7.9 weeks to 8.4 weeks, respectively), but in 2001 it decreased to 1991 levels (8.0 weeks).

a. Average age of heifers at weaning (weeks):

1991 NDHEP*				Dairy '96				Dairy 2002			
Oper. Avg.	Std. Error	Heifer Avg.	Std. Error	Oper. Avg.	Std. Error	Heifer Avg.	Std. Error	Oper. Avg.	Std. Error	Heifer Avg.	Std. Error
7.9	(0.1)	8.2	(0.1)	8.4	(0.1)	8.7	(0.1)	8.0	(0.1)	8.4	(0.1)

\*Population: Operations with at least 30 dairy cows.

### 4. Vaccination practices

The percentage of operations vaccinating heifers against bovine viral diarrhea (BVD) has remained essentially the same since increasing 11.3 percent between 1991 and 1995. Vaccination of heifers against *Hemophilus somnus* peaked in 1995 then decreased along with brucellosis between 1995 and 2001. There also was an increase in the percentage of operations vaccinating heifers against BRSV between 1991 and 1996. The percentage of operations that administered no vaccine to heifers increased from 8.7 percent in 1991 to 15.6 percent in 2001.

a. Percentage of operations that normally vaccinated dairy heifers against the following diseases:

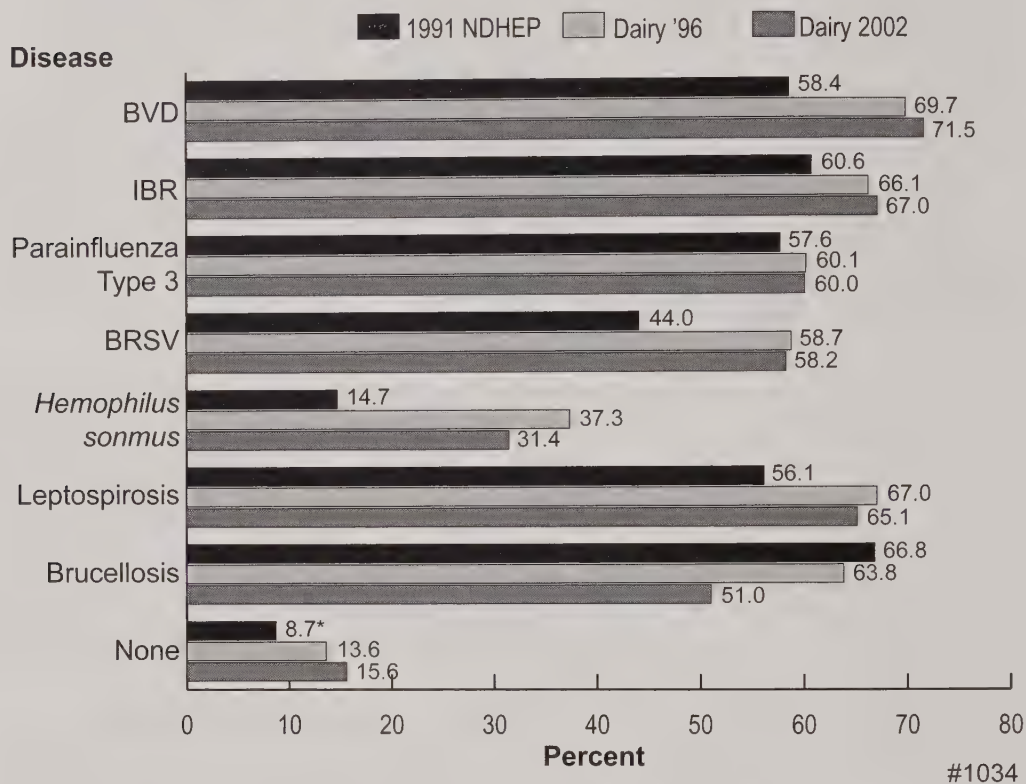
Disease	1991 NDHEP*	Std. Error	Dairy '96	Std. Error	Dairy 2002	Std. Error
Bovine viral diarrhea (BVD)	58.4	(2.1)	69.7	(1.3)	71.5	(1.2)
Infectious bovine rhinotracheitis (IBR)	60.6	(2.1)	66.1	(1.3)	67.0	(1.3)
Parainfluenza Type 3 (PI3)	57.6	(2.1)	60.1	(1.3)	60.0	(1.3)
Bovine respiratory syncytial virus (BRSV)	44.0	(2.1)	58.7	(1.3)	58.2	(1.3)
<i>Hemophilus somnus</i>	14.7	(1.4)	37.3	(1.3)	31.4	(1.2)
Leptospirosis	56.1	(2.2)	67.0	(1.3)	65.1	(1.3)
<i>Salmonella</i>	NA	NA	18.9	(1.0)	16.8	(1.0)
<i>E. coli</i> mastitis	NA	NA	18.1	(0.9)	21.3	(1.0)
Clostridia (blackleg/malignant edema)	20.7	(1.4)	32.3	(1.1)	32.8	(1.1)
Enterotoxemia	8.7	(0.9)	NA	NA	NA	NA
Brucellosis	66.8	(1.9)	63.8	(1.3)	51.0	(1.3)
<i>Mycobacterium paratuberculosis</i> (Johne's disease)	NA	NA	5.4	(0.6)	4.6	(0.5)
Neospora	NA	NA	NA	NA	3.6	(0.4)
Other	NA	NA	7.3	(0.6)	6.9	(0.6)
None	8.7**	(1.3)	13.6	(1.0)	15.6	(1.1)

\*Population: Operations with at least 30 dairy cows.

\*\*None of the above



### Percent of Operations Normally Vaccinating Dairy Heifers Against the Following Diseases



\*None of the specified diseases

#### 5. Types of BVD vaccine

The percentage of operations that administered modified live BVD vaccines to heifers increased substantially between 1995 and 2001 (40.7 percent and 49.2 percent, respectively).

a. For operations that gave BVD vaccinations to **dairy heifers**, percentage of operations by type of BVD vaccine given:

Type of BVD	Dairy '96						Dairy 2002					
	Given	Std. Error	Did Not Know	Std. Error	Not Given	Std. Error	Given	Std. Error	Did Not Know	Std. Error	Not Given	Std. Error
Killed	58.4	(1.5)	9.8	(0.9)	31.8	(1.4)	50.6	(1.6)	12.7	(1.1)	36.7	(1.5)
Modified live	40.7	(1.5)	10.3	(0.9)	49.0	(1.5)	49.2	(1.6)	12.5	(1.1)	38.3	(1.5)

## 6. Preventive practices

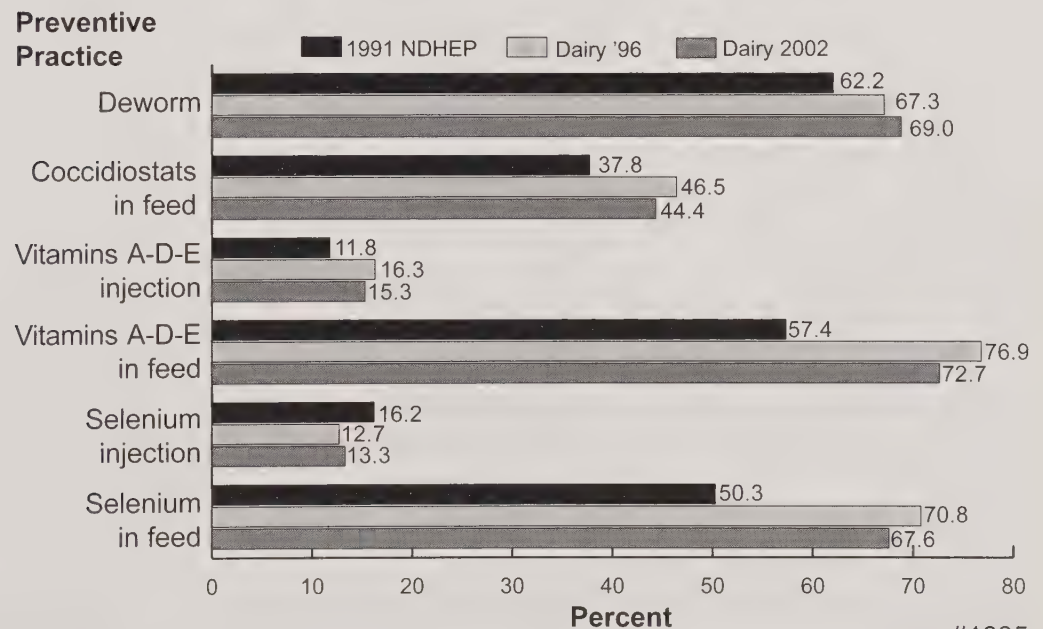
There were no major changes in the use of specific preventive practices between 1995 and 2001. However, there continues to be a downward trend in the percentage of operations using no preventive practices in dairy heifers.

a. Percentage of operations that normally used preventive practices in replacement dairy heifers:

Preventive Practice	1991 NDHEP*	Std. Error	Dairy '96	Std. Error	Dairy 2002	Std. Error
Dewormers	62.2	(2.2)	67.3	(1.3)	69.0	(1.2)
Coccidiostats in feed	37.8	(2.0)	46.5	(1.2)	44.4	(1.3)
Vitamins A-D-E injection	11.8	(1.3)	16.3	(1.0)	15.3	(1.0)
Vitamins A-D-E in feed	57.4	(2.2)	76.9	(1.1)	72.7	(1.2)
Selenium injection	16.2	(1.8)	12.7	(0.8)	13.3	(0.9)
Selenium in feed	50.3	(2.2)	70.8	(1.2)	67.6	(1.3)
Ionophores in feed (e.g., Rumensin®, Bovatec®)	40.0	(2.2)	42.2	(1.2)	44.2	(1.3)
Probiotics	NA	NA	13.1	(0.9)	14.2	(0.9)
Magnet	8.8	(1.1)	NA	NA	NA	NA
Anionic salts in feed	NA	NA	NA	NA	20.6	(1.1)
Other	NA	NA	4.8	(0.6)	3.8	(0.5)
No preventives given	8.3	(1.1)	6.4	(0.7)	5.1	(0.6)

\*Population: Operations with at least 30 dairy cows.

### Percent of Operations Normally Using the Following Preventive Practices in Replacement Dairy Heifers



#1035

## E. Cow Health

### 1. Dairy cow mortality

The number of dairy cows that died (as a percentage of the January 1, 1996, and January 1, 2002, dairy cow inventories) increased overall and throughout all herd sizes. Overall, mortality increased from 3.8 percent of the January 1996 inventory to 4.8 percent of the January 2002 inventory. Only minor changes occurred in the percentage of cows that died due to specific causes. However, there was an increase in the number of cows that died from unknown reasons and a decrease in deaths due to other known reasons.

a. Number of dairy cows that died during 1995 and 2001, as a percentage of the January 1, 1996, and January 1, 2002, dairy cow inventories, respectively, by herd size:

<b>Herd Size (Number Dairy Cows)</b>	<b>Dairy '96</b>	<b>Std. Error</b>	<b>Dairy 2002</b>	<b>Std. Error</b>
Less than 100	3.6	(0.1)	4.4	(0.1)
100 to 499	3.9	(0.1)	5.0	(0.1)
500 or more	4.0	(0.2)	4.9	(0.1)
All operations	3.8	(0.1)	4.8	(0.1)

b. Percentage of total dairy cow deaths, by producer-attributed cause:

<b>Producer-attributed Cause of Death</b>	<b>Dairy '96</b>	<b>Standard Error</b>	<b>Dairy 2002</b>	<b>Standard Error</b>
Scours, diarrhea or other digestive problems	9.0	(1.0)	8.6	(0.5)
Respiratory problems	9.6	(0.7)	10.3	(0.5)
Poison	0.9	(0.2)	0.4	(0.1)
Put down due to lameness or injury	12.7	(0.7)	13.9	(0.6)
Lack of coordination or severe depression	1.4	(0.2)	1.4	(0.2)
Mastitis	16.3	(0.8)	17.1	(0.6)
Calving problems	18.3	(0.7)	17.4	(0.7)
Other known reasons	17.0	(0.9)	11.1	(0.6)
Unknown reasons	14.8	(0.8)	19.8	(0.9)
Total	100.0		100.0	

## F. Cow Management

### 1. Separate maternity housing

More operations overall were separating maternity housing from housing used for lactating cows.

a. Percentage of operations where maternity housing was separate from housing used for lactating dairy cows, by herd size:

Herd Size (Number Dairy Cows)	Dairy '96	Standard Error	Dairy 2002	Standard Error
Less than 100	39.1	(1.3)	43.5	(1.6)
100 to 499	72.6	(2.1)	81.6	(1.7)
500 or more	94.5	(1.8)	91.9	(1.5)
All operations	45.4	(1.2)	53.1	(1.3)

### 2. Milking facilities

Although the questions regarding milking facilities differed slightly in the 1996 and 2002 studies, it is evident that a higher percentage of operations were using parlor-type milking facilities in 2001. In 1995, just 54.9 percent of cows were milked in parlors. In 2001, 70.0 percent of cows were milked in parlors.

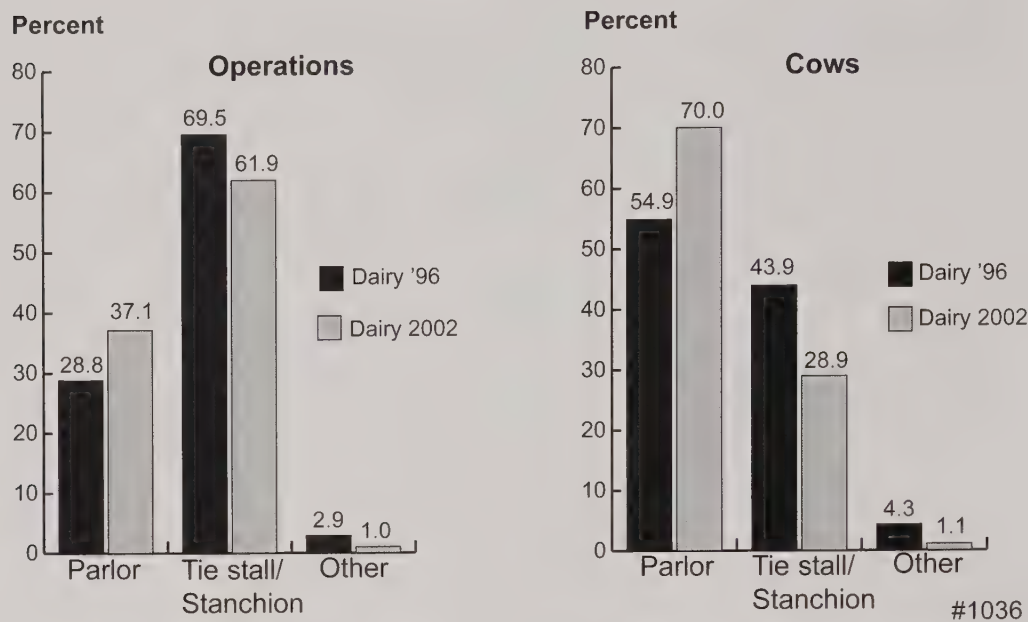
a. Percentage of operations (and percentage of cows on these operations) by primary milking<sup>1</sup> facility used in 1995 and 2001:

Facility Type	Percent Operations				Percent Cows			
	Dairy '96	Std. Error	Dairy 2002	Std. Error	Dairy '96	Std. Error	Dairy 2002	Std. Error
Parlor	28.8	(0.9)	37.1	(1.0)	54.9	(1.0)	70.0	(0.8)
Tie stall or stanchion	69.5	(0.9)	61.9	(1.0)	43.9	(1.0)	28.9	(0.8)
Other	2.9	(0.5)	1.0	(0.2)	4.3	(0.7)	1.1	(0.2)

<sup>1</sup>The 1996 survey did not ask about primary milking facility, therefore column totals for 1996 are greater than 100 percent. The 2002 survey did ask about primary milking facility.



### Percent of Operations (and Percent of Cows) by Primary Milking Facility Used in 1995 and 2001



### 3. Vaccination practices

There were minor changes from 1995 to 2001 in the percentage of operations that normally vaccinated cows against select pathogens. For example, the percentage of operations vaccinating against *E. coli* mastitis increased slightly, while the percentage of operations vaccinating against *Hemophilus somnus* decreased slightly.

a. Percentage of operations that normally vaccinated **dairy cows** against the following diseases:

Disease	Dairy '96 Total	Std. Error	Dairy 2002 Total	Std. Error
Bovine viral diarrhea (BVD)	71.4	(1.3)	74.2	(1.2)
Infectious bovine rhinotracheitis (IBR)	69.0	(1.3)	69.3	(1.3)
Parainfluenza Type 3 (PI3)	62.5	(1.3)	62.2	(1.3)
Bovine respiratory syncytial virus (BRSV)	60.8	(1.3)	61.1	(1.3)
<i>Hemophilus somnus</i>	38.4	(1.3)	32.4	(1.2)
Leptospirosis	70.7	(1.3)	70.1	(1.3)
<i>Salmonella</i>	18.8	(1.0)	17.1	(1.0)
<i>E. coli</i> mastitis	26.6	(1.1)	31.7	(1.2)
Clostridia	21.8	(1.0)	25.0	(1.1)
Neospora	NA	NA	3.3	(0.4)
Other	6.5	(0.6)	7.2	(0.6)
None	18.9	(1.1)	17.2	(1.1)

#### 4. Types of BVD vaccine

a. For operations that gave BVD vaccinations to **dairy cows**, percentage of operations by type of BVD vaccine given:

Type of BVD	Dairy '96						Dairy 2002					
	Given	Std. Error	Did Not Know	Std. Error	Not Given	Std. Error	Given	Std. Error	Did Not Know	Std. Error	Not Given	Std. Error
Killed	65.4	(1.4)	10.3	(0.9)	24.3	(1.2)	61.9	(1.5)	11.8	(1.1)	26.3	(1.3)
Modified live	29.3	(1.3)	10.7	(0.9)	60.0	(1.4)	36.7	(1.5)	11.6	(1.1)	51.7	(1.5)

b. For operations that gave BVD vaccinations to dairy cows, percentage of operations that gave annual BVD booster injections:

Dairy '96		Dairy 2002	
Percent	Standard Error	Percent	Standard Error
77.4	(1.3)	82.9	(1.2)

#### 5. Preventive practices

The percentage of operations that normally used preventive practices in lactating cows increased from 1995 to 2001 for the use of dewormers and selenium injections.

a. Percentage of operations that normally used preventive practices in lactating **dairy cows**:

Preventive Practice	Dairy '96 Total	Standard Error	Dairy 2002 Total	Standard Error
Dewormers	53.4*	(1.3)	60.3	(1.3)
Vitamins A-D-E injection	15.5*	(0.9)	17.1	(1.0)
Vitamins A-D-E in feed	81.4*	(1.1)	80.2	(1.1)
Selenium injection	8.4	(0.6)	18.0	(1.0)
Selenium in feed	72.5	(1.2)	75.7	(1.1)
Probiotics	16.7*	(0.9)	20.4	(1.0)
Anionic salts in feed	NA	NA	27.0	(1.2)
Limited potassium in dry cow ration	NA	NA	45.0	(1.3)
Other	4.4*	(0.5)	5.4	(0.6)
No preventives given	8.5*	(0.8)	3.7	(0.6)

\*Used in either lactating or dry dairy cows.

**6. Culled cows\***

Overall (and throughout all herd sizes) the number of dairy cows culled, as a percentage of the January 1, 2001, inventory, changed very little. Large herds continued to cull a higher percentage of dairy cows than medium and small herds.

a. Number of dairy cows culled in 1995 and 2001 as a percentage of the January 1, 1996, and January 1, 2002, inventories, respectively, by herd size:

<b>Herd Size (Number Dairy Cows)</b>	<b>Dairy '96</b>	<b>Standard Error</b>	<b>Dairy 2002</b>	<b>Standard Error</b>
Less than 100	23.9	(0.7)	24.9	(0.6)
100 to 499	21.6	(0.4)	23.9	(0.5)
500 or more	27.4	(0.8)	27.5	(0.6)
All operations	24.0	(0.4)	25.5	(0.3)

There was no change from 1995 to 2001 as to where dairy cows were sent when culled. Nearly four out of five culled dairy cows were sent to market, auction, or stockyard, while one in five was sent directly to a packer or slaughter plant.

b. For operations that culled dairy cows in 1995 and 2001, percentage of culled dairy cows by destination:

<b>Destination</b>	<b>Dairy '96</b>	<b>Standard Error</b>	<b>Dairy 2002</b>	<b>Standard Error</b>
Sent to market, auction or stockyard	77.4	(1.2)	78.5	(1.1)
Sent directly to packer or slaughter plant	22.1	(1.2)	20.8	(1.1)
Sent elsewhere	0.5	(0.1)	0.7	(0.2)
Total	100.0		100.0	

\*Culled cows include those that permanently left the herd but excludes those that died.

## G. Biosecurity

### 1. Physical contact with unweaned calves

There was a significant decrease between 1995 and 2001 in the percentage of operations where unweaned heifer calves had contact with weaned calves. In 1995, 33.0 percent of operations reported such contact, compared to 22.8 in 2001. The percentage of bred heifers not yet calved that had contact with preweaned heifers also declined between 1995 and 2001.

a. Percentage of operations where, after separation from the mother, unweaned heifer calves had physical contact\* with the following groups:

Age Group	1991 NDHEP**	Std. Error	Dairy '96	Std. Error	Dairy 2002	Std. Error
Weaned calves less than approximately 4 months of age	31.5	(2.0)	33.0	(1.3)	22.8	(1.2)
Calves from approximately 4 months of age to breeding	10.4	(1.3)				
Bred heifers not yet calved	4.6	(0.9)	18.8	(1.1)	13.3	(0.9)
Adult cattle	10.2	(1.3)	20.2	(1.1)	15.4	(1.0)

\*Physical contact = possible nose-to-nose contact or sniffing/touching/licking each other, including through a fence.

\*\*Population: Operations with at least 30 dairy cows.



## 2. Physical contact with other animals

The percentage of operations with female dairy cattle that had contact with other animal types changed little, with the exception of beef cattle and dogs. Contact with beef cattle decreased from 18.5 percent of operations in 1995 to 10.5 percent of operations in 2001. Contact with dogs also decreased.

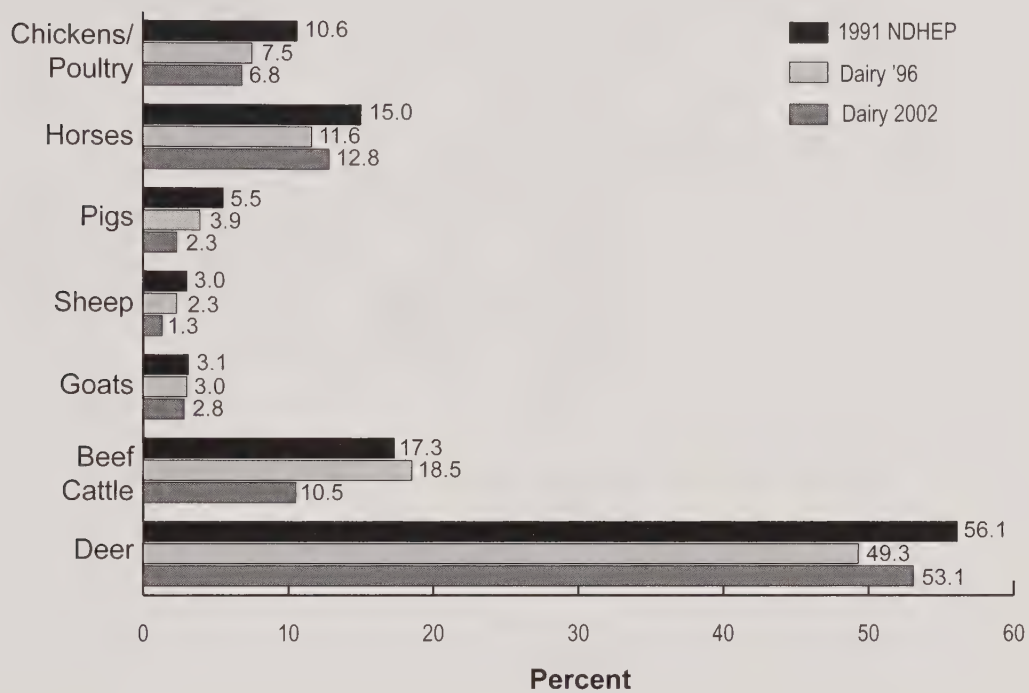
a. Percentage of operations where the following animals had physical contact\* with female dairy cattle...

Animal Type	...and/or their feed:		Question Variation	...and/or their feed, minerals, or water supply:			
	1991 NDHEP**	Std. Error		Dairy '96	Std. Error	Dairy 2002	Std. Error
Chickens/other poultry	10.6	(1.4)		7.5	(0.8)	6.8	(0.7)
Horses	15.0	(1.6)	Horses or other equine	11.6	(0.9)	12.8	(0.9)
Pigs	5.5	(1.0)		3.9	(0.6)	2.3	(0.4)
Sheep	3.0	(0.6)		2.3	(0.5)	1.3	(0.3)
Goats	3.1	(0.7)		3.0	(0.5)	2.8	(0.5)
Beef cattle	17.3	(1.7)		18.5	(1.1)	10.5	(0.8)
Exotic species	NA	NA		0.8	(0.2)	0.6	(0.2)
Deer	56.1	(2.2)	Deer or other cervidae	49.3	(1.1)	53.1	(1.3)
Dogs	NA	NA		77.8	(1.1)	70.6	(1.2)
Cats	NA	NA		90.2	(0.8)	87.8	(0.8)

\*Physical contact: possible nose-to-nose contact or sniffing/touching/licking each other, including through a fence.

\*\*Population: Operations with at least 30 dairy cows.

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**Percent of Operations Where the Following Animals had Physical Contact with Female Dairy Cattle****Animal Type**

#1037

### 3. Biosecurity for new arrivals

There was little change between 1995 and 2001 in the percentage of producers who reported that “any” cattle were brought onto their operations. However, more bulls were brought onto operations in 2001 than in 1995 (13.7 percent of operations reported adding weaned dairy bulls in 2001, and 2.3 percent of operations reported adding weaned beef bulls in 2001).

a. Percentage of operations that brought the following classes of cattle onto the operation:

Class of Cattle	1991 NDHEP*	Std. Error	Question Variation	Dairy '96	Std. Error	Question Variation	Dairy 2002	Std. Error
Calves not yet weaned	9.6	(1.2)		5.0	(0.7)		5.1	(0.7)
Heifers weaned but not yet bred	11.2	(1.3)		7.3	(0.7)		6.7	(0.7)
Bred heifers not yet calved	19.3	(1.6)		18.5	(0.9)		15.8	(0.9)
Lactating cows	25.8	(2.0)		19.9	(1.0)		16.4	(1.0)
Dry cows	10.0	(1.4)		7.1	(0.8)		5.9	(0.6)
Bulls	22.4	(11.7)	Weaned	8.7	(0.7)	Dairy bulls (weaned)	13.7	(0.9)
						Beef bulls (weaned)	2.3	(0.4)
Other cattle	3.3	(0.7)	Other heifers/ cows	1.9	(0.4)	Beef heifers and cows	1.5	(0.3)
			Steers (weaned)	2.0	(0.3)	Steers (weaned)	1.1	(0.3)
Any cattle	53.3	(2.1)		43.9	(1.3)		45.7	(1.4)

\*Population: Operations with at least 30 dairy cows.

#### 4. Quarantine

The percentage of operations that quarantined cattle brought onto the operation has remained relatively small across all three NAHMS' dairy studies. Calves not yet weaned were quarantined more frequently than cows and heifers, with 37.0 percent of operations quarantining all unweaned calves in 2001. Lactating and dry cows remained the least common classes of cattle to be quarantined, with only 9.0 percent of operations quarantining all lactating cows and just 7.1 percent quarantining all dry cows in 2001.

a. For operations that brought the following classes of cattle onto the operation, percentage of operations that quarantined all new arrivals in the following categories upon arrival\*:

Class of Cattle	1991 NDHEP**	Std. Error	Question Variation	Dairy '96	Std. Error	Question Variation	Dairy 2002	Std. Error
Calves not yet weaned	27.9	(6.1)		26.8	(5.2)		37.0	(7.3)
Heifers weaned but not yet bred	23.1	(5.1)		24.5	(4.7)		23.9	(3.9)
Bred heifers not yet calved	12.8	(3.2)		15.3	(1.9)		19.6	(2.3)
Lactating cows	5.5	(1.9)		6.0	(1.7)		9.5	(1.6)
Dry cows	9.0	(4.4)		17.9	(4.8)		7.1	(2.2)
Bulls	12.5	(3.0)	Weaned	11.2	(2.4)	Dairy bulls (weaned)	15.9	(2.4)
						Beef bulls (weaned)	23.6	(6.5)
Other cattle	34.0	(9.6)	Other heifers/ cows	15.6	(6.0)	Beef heifers and cows	24.0	(8.5)
			Steers (weaned)	21.0	(6.6)	Steers (weaned)	40.0	(11.4)

\*Number of head brought on and number of head quarantined were both asked in Dairy '96.

\*\*Population: Operations with at least 30 dairy cows.



b. For operations that quarantined new arrivals, average number of days new animals in the following categories were quarantined:

<b>Class of Cattle</b>	<b>1991 NDHEP*</b>	<b>Std. Error</b>	<b>Question Variation</b>	<b>Dairy '96</b>	<b>Std. Error</b>	<b>Question Variation</b>	<b>Dairy 2002</b>	<b>Std. Error</b>
Calves not yet weaned	40.3	(8.0)		40.8	(5.7)		49.2	(9.3)
Heifers weaned but not yet bred	24.3	(3.7)		21.5	(4.2)		28.2	(6.0)
Bred heifers not yet calved	14.4	(2.4)		16.8	(2.3)		23.7	(4.0)
Lactating cows	18.2	(7.3)		11.7	(2.3)		20.1	(4.1)
Dry cows	17.8	(4.4)		8.9	(2.1)		21.4	(4.3)
Bulls	19.4	(4.0)	Weaned	21.0	(3.1)	Dairy bulls (weaned)	19.0	(2.5)
						Beef bulls (weaned)	32.0	(12.9)
Other cattle	65.8	(30.8)	Other heifers/ cows	24.3	(9.1)	Beef heifers and cows	31.1	(6.6)
			Steers (weaned)	41.5	(22.0)	Steers (weaned)	41.3	(14.0)

\*Population: Operations with at least 30 dairy cows.

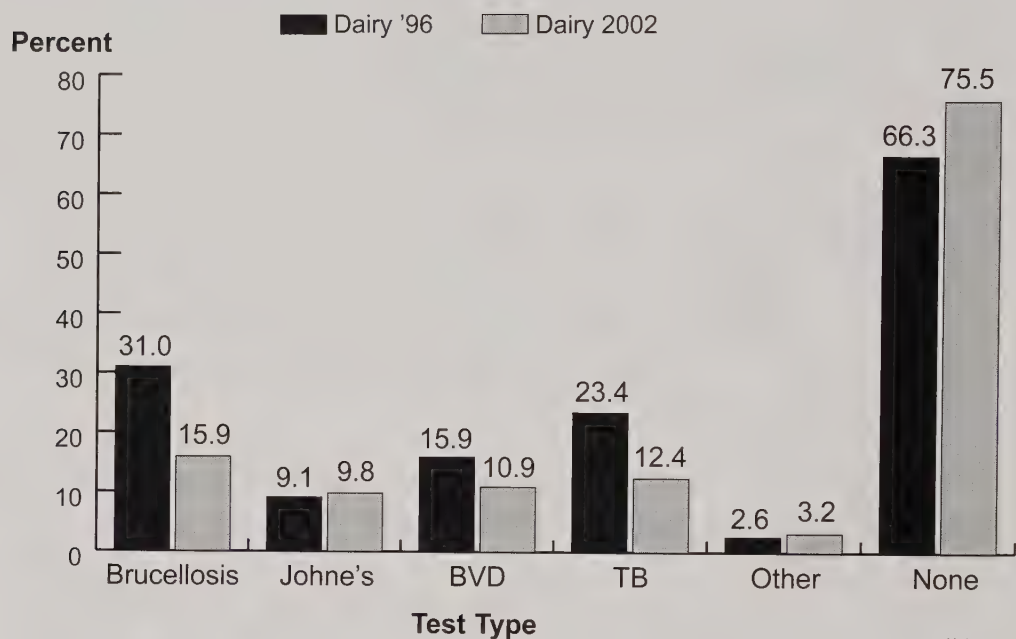
### 5. Testing required for new arrivals

There was a substantial decrease in the percentage of operations that required cattle to be tested for brucellosis before being brought onto the operation (31.0 percent in 1995 compared to 15.9 percent in 2001). This decrease most likely reflects the progress made in the U.S. Bovine Brucellosis Eradication Program (decreases in the percentage of operations vaccinating for brucellosis were also noted for this period, 63.8 percent to 51.0 percent, respectively). Similarly, the percentage of operations that required tuberculosis testing before adding new cattle decreased from 23.4 percent in 1995 to 12.4 percent in 2001. The percentage of operations that **did not** require testing of cattle before they were brought onto the operation increased from 66.3 percent in 1995 to 75.5 percent in 2001.

a. For operations that brought cattle onto the farm, percentage of operations by testing normally required by the operation before bringing cattle onto the farm, and by herd size:

Test Type	Herd Size (Number of Dairy Cows)															
	Small (Less than 100)				Medium (100-499)				Large (500 or More)				All Operations			
	Std. '96	Error	Std. '02	Error	Std. '96	Error	Std. '02	Error	Std. '96	Error	Std. '02	Error	Std. '96	Error	Std. '02	Error
Brucellosis	28.5	(2.1)	13.1	(1.8)	38.3	(2.9)	19.5	(2.1)	50.6	(4.4)	29.9	(2.7)	31.0	(1.7)	15.9	(1.3)
Mycobacterium paratuberculosis (Johne's disease)	8.5	(1.3)	8.3	(1.4)	11.0	(2.3)	12.7	(1.9)	9.6	(2.9)	12.2	(1.9)	9.1	(1.1)	9.8	(1.1)
Bovine viral diarrhea (BVD)	15.1	(1.6)	8.6	(1.4)	18.4	(2.5)	15.6	(2.1)	19.4	(3.9)	15.0	(2.1)	15.9	(1.3)	10.9	(1.1)
Bovine tuberculosis (TB)	22.3	(1.9)	10.8	(1.5)	26.8	(2.7)	14.3	(1.7)	31.4	(4.2)	20.7	(2.3)	23.4	(1.6)	12.4	(1.1)
Other	2.3	(0.5)	2.8	(0.8)	3.6	(1.4)	4.3	(1.3)	3.9	(2.1)	3.5	(1.1)	2.6	(0.5)	3.2	(0.6)
None	68.7	(2.1)	78.8	(2.2)	60.0	(2.9)	70.6	(2.5)	45.7	(4.5)	61.2	(2.9)	66.3	(1.8)	75.5	(1.6)

**Percent of Operations\* by Testing Normally Required by the Operations**



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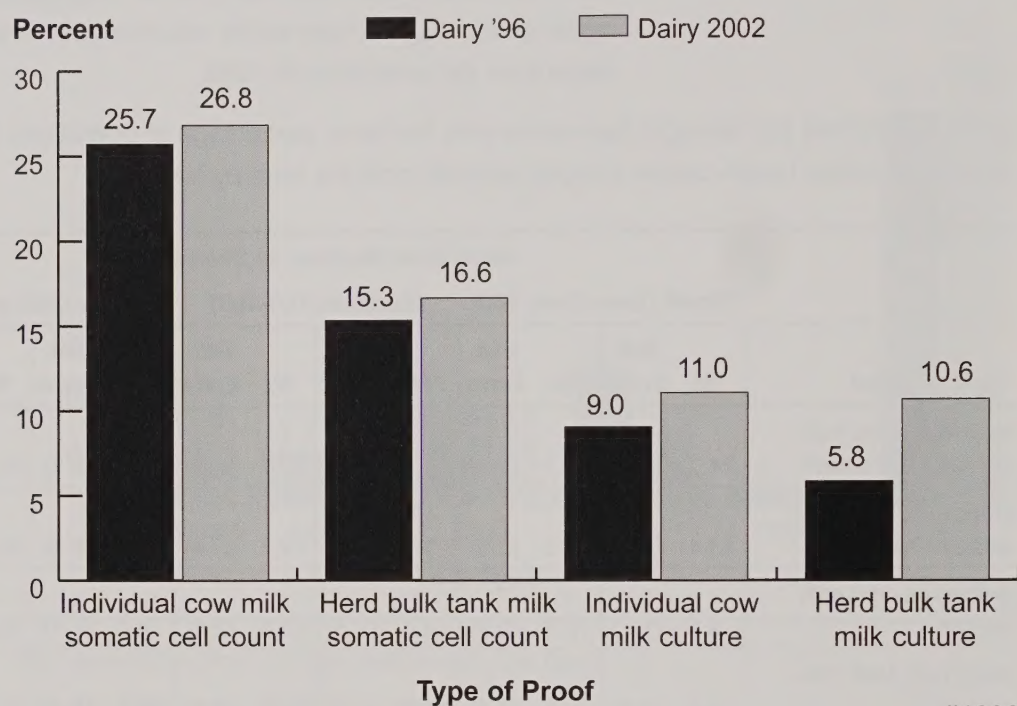
\*For operations that brought cattle onto the farm.

There was no change between 1995 and 2001 in the percentage of operations that required individual or herd bulk tank milk somatic cell counts, or individual cow milk cultures before bringing cattle onto the operation. However, in 2001 a higher percentage of operations required bulk tank milk cultures prior to adding cattle than did operations in 1995.

- b. For operations that brought dairy cows onto the farm, percentage of operations that normally required testing or proof of udder health before bringing animals onto the farm by herd size:

Herd Size (Number of Dairy Cows)																
Small (Less than 100)				Medium (100-499)				Large (500 or More)				All Operations				
Type of Proof	Std.		Std.		Std.		Std.		Std.		Std.		Std.		Std.	
	'96	Error	'02	Error	'96	Error	'02	Error	'96	Error	'02	Error	'96	Error	'02	Error
Individual cow milk somatic cell count	24.7	(2.7)	26.7	(3.7)	30.1	(4.1)	26.7	(4.0)	27.9	(8.7)	29.5	(5.2)	25.7	(2.3)	26.8	(2.8)
Herd bulk tank milk somatic cell count	13.4	(2.0)	14.3	(2.9)	21.3	(3.1)	19.2	(3.4)	45.7	(9.0)	34.1	(5.9)	15.3	(1.7)	16.6	(2.2)
Individual cow milk culture	9.1	(1.7)	10.7	(2.5)	8.4	(1.8)	10.6	(2.6)	9.4	(4.1)	18.8	(4.8)	9.0	(1.4)	11.0	(1.8)
Herd bulk tank milk culture	3.9	(0.9)	9.5	(2.4)	11.8	(2.4)	10.0	(2.6)	35.7	(8.4)	31.0	(6.0)	5.8	(0.9)	10.6	(1.8)



**Percent of Operations\* that Normally Required Testing or Proof of Udder Health**

\*For operations that brought dairy cows onto the farm.



## Dairy 2002 Study Objectives and Related Outputs

1. Describe baseline dairy cattle health and management practices and trends in dairy farm health management.

- Part I: Reference of Dairy Health and Management in United States, 2002, December 2002
  - **Part II: Changes in the United States Dairy Industry, 1991-2002, June 2003**
  - Part III: Reference of Dairy Health and Health Management in the United States, 2002, expected fall 2003
  - Colostrum and bST info sheets, December 2002
  - Mycoplasma, Milking Procedures, and HBS info sheets, June 2003
2. Describe strategies to prevent and reduce Johne's disease.
- Johne's Disease on United States Dairy Operations, 2002, expected fall 2003

3. Evaluate management factors associated with the presence of certain food safety pathogens.

- *Salmonella* and *Campylobacter*, *E. Coli*, and Food Safety Pathogens Bulk Tank info sheets, expected fall 2003

4. Describe the preparedness of producers to respond to foreign animal diseases, such as foot and mouth disease.

- Info sheets, expected winter 2003

5. Describe waste handling systems.

- Part III: Reference of Dairy Health and Management in the United States, 2002, expected fall 2003
- Interpretive report, expected fall 2003

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